ORDER NO. ARD82060152A4-01

# Service Manual

Cassette Deck

## RS-M255X

(Silver Face)

dbx* Equipped Cassette Deck with Electronic Multi-Mode Counter

** DOLBY SYSTEM

This is the Service Manual for the following areas.
[F] ····· For Asian PX.
[J] ····· For European PX.

**RS-M250 MECHANISM SERIES**

**NOTE:**
For the products (RS-M255X) delivered to PX, please refer to the table below and the attached Service Manual, since their parts are the same as those of the silver type products delivered to Asia, Latin America, the Middle East and Africa (regions marked [N] in the Service Manual) except for the parts listed in the table.

## PARTS COMPARISON TABLE:

Please revise the original parts list in the Service Manual RS-M255X (of the silver type model for [N] mark areas) to conform to the changes shown herein.
If new part numbers are shown, be sure to use them when ordering parts.

| Ref. No. | Part Name & Description | Part Numbers | | Remarks |
|---|---|---|---|---|
| | | [N] ··· For Asia, Latin America, Middle East and Africa areas. "Silver Type" | [F] ··· **For Asian PX.** [J] ··· **For European PX. "Silver Type"** | |
| G35 | Main Name Plate | QGS2985 | QGS3036 | |
| A2 | Instruction Book | QQT3266 | QQT3357 | |
| P1 | Inside Carton | QPN4290 | QPN4306 | |

* The term dbx is a registered trademark of dbx Inc.
** 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Tokyo
Matsushita Electric Industrial Co., Ltd.
1-2, 1-chome, Shibakoen, Minato-ku, Tokyo 105 Japan

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# Service Manual

Cassette Deck

## RS-M255X

(Silver Face / Black Face)

dbx Equipped Cassette Deck with Electronic Multi-Mode Counter

DOLBY SYSTEM

This is the Service Manual for the following areas.
- [N] ..... For Asia, Latin America, Middle East and Africa areas.
- [A] ..... For Australia.

- Please use this manual together with the service manual for model No. RS-M255X (original) order No. ARD82010116C2-29.
- For schematic diagrams, circuit board (Voltage Regulator Circuit Board), wiring connection diagram (Power Supply) and parts lists, refer to the ones in this Service Manual.
  For other information, refer to both this Service Manual and the original Service Manual.

### RS-M250 MECHANISM SERIES

### Specifications

| | |
|---|---|
| Track system: | 4-track 2-channel stereo recording and playback |
| Tape speed: | 4.8cm/s (1-7/8ips) |
| Wow and flutter: | 0.038% (WRMS) |
| Frequency response: | Metal tape; 20 – 20,000Hz<br>30 – 17,000Hz ±3dB |
| | $CrO_2$ tape; 20 – 19,000Hz<br>30 – 16,000Hz ±3dB |
| | Normal tape; 20 – 18,000Hz<br>30 – 15,000Hz ±3dB |
| Dynamic range: | 110dB (at 1kHz) with dbx in |
| Max. input level improvement: | 10dB or more improved with dbx in (at 1kHz) |
| Signal-to-noise ratio: | dbx* in; 92dB<br>Dolby** NR in; 68dB (above 5kHz)<br>Dolby NR out; 58dB (signal level = max. input level A weighted, $CrO_2$ type tape) |
| Fast forward and rewind time: | Approx. 90 seconds with C-60 cassette tape |
| Inputs: | MIC; sensitivity 0.25mV, applicable microphone impedance 400Ω – 10kΩ<br>LINE; sensitivity 60mV, input impedance 47kΩ |
| Outputs: | LINE; output level 700mV, load impedance 22kΩ over<br>HEADPHONES; output level 125mV (at 8Ω) |
| Bias frequency: | 85kHz |
| Motor: | 2-motor system |
| Heads: | 2-head system<br>1-SX (Sendust Extra) head for record/playback<br>1-double-gap ferrite head for erasure |
| Power requirement: | AC; 110/125/220/240V, 50-60Hz<br>preset power voltage 240V |
| Power consumption: | [N] ..... 18W<br>[A] ..... 28W |
| Dimensions: | 43.0cm(W) × 10.8cm(H) × 33.1cm(D) |
| Weight: | 6.0kg |

Specifications are subject to change without notice.
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** 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

Technics

**Matsushita Electric Trading Co., Ltd.**
P.O. Box 288, Central Osaka Japan



**NOTES:** RESISTORS
ERD.....Carbon
ERG.....Metal-oxide
ERS.....Metal-oxide
ERO.....Metal-film
ERX.....Metal-film
ERQ.....Fuse type metallic
ERC.....Solid
ERF.....Cement

CAPACITORS
ECBA .....Ceramic
ECG□.....Ceramic
ECK□.....Ceramic
ECC□.....Ceramic
ECF□.....Ceramic
ECQM.....Polyester film
ECQE .....Polyester film
ECQF .....Polypropylene
ECE□.....Electrolytic
ECE□N ...Non polar electrolytic
ECQS .....Polystyrene
ECS□.....Tantalum
QCS .....Tantalum

### REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

| Ref. No. | Part No. |
|---|---|
| **RESISTORS** | |
| R 1, 2 | ERD25TJ273 |
| R 3, 4 | ERD25TJ474 |
| R 5, 6 | ERD25FJ471 |
| R 7, 8 | ERD25FJ332 |
| R 9, 10 | ERD25FJ680 |
| R 11, 12 | ERD25FJ103 |
| R 13, 14 | ERD25TJ334 |
| R 15, 16 | ERD25FJ472 |
| R 17, 18 | ERD25FJ562 |
| R 19, 20 | ERD25TJ225 |
| R 21, 22 | ERD25FJ332 |
| R 23, 24 | ERD25TJ225 |
| R 25, 26 | ERD25FJ101 |
| R 29, 30 | ERD25FJ103 |
| R 31, 32 | ERD25FJ681 |
| R 33, 34 | ERD25FJ100 |
| R 35, 36 | ERD25FJ182 |
| R 37, 38 | ERD25FJ472 |
| R 39 | ERD25FJ561 |
| R 40 | ERD25FJ822 |
| R 41, 42 | ERD25TJ123 |
| R 43, 44 | ERD25FJ151 |
| R 45, 46 | ERD25FJ102 |
| R 47, 48 | ERD25TJ274 |
| R 49, 50, 51, 52 | ERD25TJ105 |
| R 53, 54 | ERD25TJ473 |
| R 55, 56 | ERD25FJ332 |
| R 57, 58 | ERD25TJ274 |
| R 59, 60 | ERD25TJ184 |
| R 61, 62 | ERD25FJ332 |
| R 63, 64 | ERD25FJ181 |
| R 65, 66 | ERD25FJ101 |
| R 67, 68 | ERD25TJ223 |
| R 69, 70 | ERD25TJ154 |
| R 71, 72 | ERD25FJ102 |
| R 73, 74 | ERD25FJ392 |
| R 75, 76 | ERD25FJ681 |
| R 77, 78 | ERD25FJ820 |
| R 79, 80 | ERD25FJ392 |
| R 81, 82, 83, 84 | ERD25FJ152 |
| R 85, 86 | ERD25FJ270 |
| R 87, 88 | ERD25FJ562 |
| R 89, 90 | ERD25FJ682 |
| R 91, 92 | ERD25FJ821 |
| R 93, 94 | ERD25TJ473 |
| R 95, 96 | ERD25FJ820 |
| R 97, 98 | ERD25FJ560 |
| R 101 | ERD25FJ222 |
| R 102 | ERD25TJ224 |
| R 103 | ERD25TJ473 |
| R 104 | ERD25TJ563 |
| R 105 | ERD25FJ472 |
| R 106 | ERD25TJ473 |
| R 107 | ERD25TJ273 |
| R 108 | ERD25FJ472 |
| R 109, 110 | ERD25TJ473 |
| R 111 | ERD25TJ104 |
| R 112, 113, 114, 115 | ERD25TJ473 |
| R 116 | ERD25FJ562 |
| R 117 | ERD25TJ223 |
| R 118 | ERD25TJ224 |
| R 119 | ERD25FJ152 |
| R 120 | ERD25TJ273 |
| R 121, 122, 123 | ERD25TJ473 |
| R 124 | ERD25TJ104 |
| R 125 | ERD25FJ101 |
| R 126 | ERD25FJ821 |
| R 127, 128 | ERD25FJ391 |
| R 129 | ERD50FJ560 |
| R 130 | ERD25FJ103 |
| R 131 | ERD25TJ104 |
| R 132 | ERD25TJ183 |
| R 133, 134, 135 | ERD25TJ274 |
| R 136 | ERD25TJ223 |
| R 137 | ERD25TJ123 |
| R 138 | ERD25FJ562 |
| R 139 | ERD25FJ100 |
| R 140 | ERD25FJ562 |
| R 141 | ERD25FJ1R0 |
| R 142 | ERD25FJ822 |
| R 143 | ERD25TJ154 |
| R 144 | ERD25TJ124 |
| R 145 | ERD25TJ473 |
| R 146 | ERD25FJ332 |
| R 147 | ERD25FJ103 |
| R 148 | ERD25FJ332 |
| R 149 | ERD25FJ222 |
| R 150 | ERD25FJ822 |
| R 151 | ERD25TJ154 |
| R 152 | ERD25TJ563 |
| R 153 | ERD25FJ471 |
| R 154 | ERD25FJ122 |
| R 155, 156 | ERD25FJ102 |
| R 157, 158 | ERD25TJ183 |
| R 159, 160 | ERD25FJ102 |
| R 161 | ERD25TJ223 |
| R 162 | ERD25FJ101 |
| R 163, 164 | ERD25TJ123 |
| R 165, 166 | ERD25FJ562 |
| R 167 | ERD25FJ100 |
| R 168, 169 | ERD25FJ102 |
| R 170 | ERD25FJ821 |
| R 171 | ERQ12HJ100 |
| R 201, 203 | ERD25TJ104 |
| R 205, 206 | ERD25FJ101 |
| R 207, 208 | ERD25TJ474 |
| R 209, 210 | ERD25TJ105 |
| R 211, 212 | ERD25TJ124 |
| R 213, 214 | ERD25TJ473 |
| R 215, 216 | ERD25FJ472 |
| R 217, 218 | ERD25TJ473 |
| R 219, 220 | ERD25TJ333 |
| R 221, 222 | ERD25FJ103 |
| R 223, 224 | ERD25TJ473 |
| R 225, 226 | ERD25FJ470 |
| R 227, 228 | ERD25TJ124 |
| R 229, 230 | ERD25FJ332 |
| R 231, 232 | ERD25TJ473 |
| R 233, 234, 235, 236 | ERD25TJ104 |
| R 237, 238 | ERD25FJ103 |
| R 239, 240 | ERD25TJ333 |
| R 241 | ERD25FJ102 |
| R 242 | ERD25TJ102 |
| R 243, 244 | ERD25TJ473 |
| R 245, 246 | ERD25TJ101 |
| R 247, 248 | ERD25TJ473 |
| R 249, 250 | ERD25FJ103 |
| R 251, 252 | ERD25FJ102 |
| R 253, 254 | ERD25FJ392 |
| R 255, 256 | ERD25TJ333 |
| R 257, 258 | ERD25TJ104 |
| R 259, 260 | ERD25FJ472 |
| R 261, 262 | ERD25TJ333 |
| R 263, 264 | ERD25FJ682 |
| R 265, 266 | ERD25FJ472 |
| R 267, 268 | ERD25FJ220 |
| R 269, 270 | ERD25TJ393 |
| R 271, 272 | ERD25TJ473 |
| R 273, 274 | ERD25FJ332 |
| R 275, 276 | ERD25TJ333 |
| R 277, 278 | ERD25TJ394 |
| R 279, 280 | ERD25FJ102 |
| R 281, 282 | ERD25FJ8R2 |
| R 283, 284 | ERD25TJ333 |
| R 285 | ERD25FJ103 |
| R 287 | ERD25FJ392 |
| R 289, 290 | ERD25FJ103 |
| R 291, 292 | ERD25TJ155 |
| R 301, 302, 303, 304 | ERD25FJ471 |
| R 305 | ERD50FJ221 |
| R 306, 307 | ERD25TJ473 |
| R 309 | ERD25TJ223 |
| R 310 | ERD25TJ104 |
| R 311 | ERD25TJ473 |
| R 312 | ERD25FJ183 |
| R 314 | ERD25FJ182 |
| R 315 | ERD25FJ102 |
| R 316 | ERD25FJ103 |
| R 317 | ERD25FJ472 |
| R 318 | ERD25FJ472 |
| R 319 | ERD25TJ154 |
| R 320 | ERD25TJ154 |
| R 321, 322 | ERD25TJ683 |
| R 323, 324 | ERD25TJ563 |
| R 325, 326 | ERD25TJ224 |
| R 327, 328 | ERD25FJ222 |
| R 329 | ERD25FJ100 |
| R 330 | ERD25FJ562 |
| R 331 | ERD25FJ562 |
| R 332 | ERD25TJ473 |
| R 333 | ERD25TJ104 |
| R 334 | ERD25TJ224 |
| R 335 | ERD25TJ473 |
| R 336 | ERD25FJ332 |
| R 337, 338 | ERD25TJ684 |
| R 339, 340 | ERD25FJ562 |
| R 401 ⚠ | ERD25FJ102 |
| R 402 [N] ⚠ | ERQ12HJ2R7 |
| [For Asia, Latin America, Middle East and Africa areas.] [A] ⚠ | ERX12ANJ2R7 |
| [For Australia.] | |
| R 403 ⚠ | ERD25FJ102 |
| R 404 [N] | ERD25FJ821 |
| [For Asia, Latin America, Middle East and Africa areas.] [A] | ERD25FJ471 |
| [For Australia] | |
| R 405 [A] | ERD25FJ391 |
| [For Australia.] | |
| R 406 | ERD25FJ332 |
| R 407 | ERD25FJ472 |
| R 408 | ERD25FJ103 |
| R 409 ⚠ | ERD25FJ102 |
| R 410 [N] ⚠ | ERQ12HJ2R7 |
| [For Asia, Latin America, Middle East and Africa areas.] [A] ⚠ | ERX12ANJ2R7 |
| [For Australia.] | |
| R 411 ⚠ | ERD25FJ102 |
| R 412 | ERD25FJ103 |
| R 413 | ERD25TJ823 |
| R 414 ⚠ | ERX2ANJ5R6 |
| R 415 [N] ⚠ | ERD25FJ182 |
| [For Asia, Latin America, Middle East and Africa areas.] [A] ⚠ | ERD25FJ102 |
| [For Australia] | |
| R 416 | ERD25FJ103 |
| R 417 [A] ⚠ | ERD25FJ821 |
| [For Australia.] | |
| R 418 [N] | ERD25FJ821 |
| [For Asia, Latin America, Middle East and Africa areas.] [A] | ERD50FJ331 |
| [For Australia.] | |
| R 419 [A] | ERD25FJ121 |
| [For Australia.] | |
| R 420 [N] | ERD25FJ821 |
| [For Asia, Latin America, Middle East and Africa areas.] [A] | ERD50FJ331 |
| [For Australia.] | |
| R 421 | ERD25TJ104 |
| R 422 | ERD25TJ223 |
| R 423 | ERD25TJ123 |
| R 424 | ERD25FJ560 |
| R 425, 426 [N] | ERD50FJ181 |
| [For Asia, Latin America, Middle East and Africa areas.] [A] | ERD50FJ271 |
| [For Australia.] | |
| R 428 [A] | ERD25FJ392 |
| [For Australia.] | |
| R 429 [A] | ERD25FJ562 |
| [For Australia.] | |
| R 430[A] | ERD25TJ683 |
| [For Australia.] | |
| R 501, 502, 503, 504, 505 | ERD25TJ473 |
| R 506 | ERD25FJ331 |
| R 507 | ERD25FJ271 |
| R 508 | ERD25FJ331 |
| R 509 | ERD25FJ271 |
| R 510 | ERD25FJ331 |
| R 511 | ERD25FJ271 |
| R 512 | ERD25TJ104 |
| R 513 | ERD25TJ223 |
| R 514 | ERD25FJ562 |
| R 515 | ERX12ANJR47 |
| R 516 | ERD25FJ1R5 |
| R 517 | ERD25FJ222 |
| R 523 | ERD25FJ222 |
| R 524 | ERD25FJ102 |
| R 525 | ERD25FJ272 |
| R 526 | ERD25FJ562 |
| R 527 | ERD25FJ471 |
| R 701 | ERD25FJ222 |
| R 702 | ERD25FJ221 |
| R 703 | ERD25FJ331 |
| R 704 | ERD25FJ102 |
| R 705, 706 | ERD25FJ821 |
| **VARIABLE RESISTORS** | |
| VR 1, 2 | EWJ5SAF22A24 |
| VR 3, 4 | QWKGTA024A54 |
| VR 5, 6 | EVNM4AA00B24 |
| VR 7, 8, 9, 10 | EVNM4AA00B15 |
| VR 201, 202, 203, 204 | EVNM0AA00B54 |
| VR 205, 206, 207, 208 | EVNM0AA00B14 |
| VR 301 | EVNM4AA00B24 |
| VR 302 | EVNM4AA00B53 |
| VR 501 | EVNK4AA00B14 |
| **CAPACITORS** | |
| C 1, 2 | ECEA1HS100 |
| C 3, 4 | ECFDD103KXY |
| C 5, 6 | ECEA50Z1 |
| C 7, 8 | ECEA50ZR47 |
| C 9, 10 | ECKD1H681KB |
| C 11, 12 | ECEA1AS221 |
| C 13, 14 | ECQM1H123JZ |
| C 15, 16 | ECCD1H181K |
| C 17, 18 | ECQM1H152JZ |
| C 19, 20 | ECQM1H123JZ |
| C 21, 22, 23, 24 | ECEA50Z1 |
| C 25, 26 | ECKD1H392KB |
| C 27, 28 | ECEA1AS470 |
| C 29, 30 | ECEA50M1R |
| C 31, 32 | ECKD1H103ZF |
| C 33, 34 | ECEA16M10R |
| C 35, 36 | ECEA1AS221 |
| C 37, 38 | ECQV05334JZ |
| C 39, 40 | ECQM1H392JZ |
| C 41, 42 | ECQM1H472JZ |
| C 43, 44 | ECEA1HS100 |
| C 45, 46 | ECQM1H273JZ |
| C 47, 48 | ECEA50MR33R |
| C 49, 50 | ECQM1H104JZ |
| C 51, 52 | ECEA1HS100 |
| C 53, 54 | ECFDD473KXY |
| C 55, 56 | ECEA1AS471 |
| C 57, 58 | ECQM1H562JZ |
| C 59, 60 | ECQV05224JZ |
| C 61, 62, 63, 64 | ECEA1HS100 |
| C 65, 66 | ECEA25N3R3 |
| C 67, 68 | ECQV05154JZ |
| C 69, 70 | ECEA50Z1 |
| C 71, 72 | ECEA50Z2R2 |
| C 73, 74 | ECQM1H273JZ |
| C 75, 76 | ECQM1H682JZ |
| C 77, 78 | ECQM1H153JZ |
| C 79, 80 | ECQM1H333JZ |
| C 81, 82 | ECQM1H683JZ |
| C 83 | ECEA1CS221 |
| C 84 | ECEA1CS471 |
| C 85, 86 | ECQV0568JZ |
| C 87, 88 | ECEA1ES220 |
| C 89, 90 | ECKD1H102KB |
| C 91, 92 | ECQM1H392JZ |
| C 93, 94 | ECKD2H121KB |
| C 95, 96 | ECCD1H101KC |
| C 97 | ECEA1AS101 |
| C 98 | ECEA1HS100 |
| C 99 | ECEA50ZR47 |
| C 100 | ECEA1HS100 |
| C 101, 102 | ECEA1CS330 |
| C 103, 104 | ECFDD223KXY |
| C 105, 106 | ECEA1HS100 |
| C 107 | ECEA1HF100 |
| C 108 | ECQM1H822KZ |
| C 109 | ECKD1H103ZF |
| C 110 | ECFDD153KXY |
| C 111 | ECQP1153JZ |
| C 112 | ECEA1HSR33 |
| C 113 | ECEA50Z1 |
| C 114 | ECEA50ZR22 |
| C 115 | ECEA1HS100 |
| C 116 | ECEA25Z4R7 |
| C 117 | ECEA1CS330 |
| C 118, 119 | ECQM1H104JZ |
| C 120 | ECKD1H103ZF |
| C 121, 122 | ECKD1H223ZF |
| C 123, 124 | ECEA1HS100 |
| C 125, 126 | ECCD1H221K |
| C 127, 128 | ECKD1H103ZF |
| C 129, 130 | ECKD1H472MD |
| C 131 | ECKD1H103ZF |
| C 132, 133 | ECKD1H223ZF |
| C 135, 136 | ECQM1H152JZ |
| C 137, 138 | ECKD1H102KB |
| C 141, 142, 147 | ECKD1H223ZF |
| C 148 | ECKD1H392KB |
| C 201, 202 | ECEA25Z4R7 |
| C 203, 204 | ECEA50Z1 |
| C 205, 206, 207, 208 | ECQV05104JZ |
| C 209, 210 | ECQV05334JZ |
| C 211, 212 | ECCD1H221K |
| C 213, 214 | ECQM1H103JZ |
| C 215, 216 | ECCD1H101KC |
| C 217, 218 | ECQM1H103JZ |
| C 219, 220 | ECCD1H101KC |
| C 221, 222, 223, 224 | ECEA25Z4R7 |
| C 225, 226, 227, 228 | ECQV05104JZ |
| C 229, 230, 231, 232 | ECQM1H332JZ |
| C 233, 234 | ECCD1H331K |
| C 235, 236 | ECQV05104JZ |
| C 237, 238 | ECQM1H103JZ |
| C 239, 240 | ECQM1H102JZ |
| C 241, 242 | ECEA16M10R |
| C 243, 244 | ECEA1HS100 |
| C 245 | ECQM1H102JZ |
| C 247, 248 | ECEA1ES470 |
| C 249, 250 | ECCD1H151KC |
| C 301 | ECFD104KXY |
| C 302 | ECFDD223KXY |
| C 303, 304 | ECEA50Z1 |
| C 305, 306 | ECEA50ZR47 |
| C 307, 308 | ECEA1HS100 |
| C 309 | ECEA1ES101 |
| C 310 | ECFDD473KXY |
| C 311 | ECKD1H682MD |
| C 401 ⚠ | ECEA1ES332 |
| C 402 ⚠ | ECEA1ES101 |
| C 403 | ECKD1H103ZF |
| C 404 | ECEA1ES220 |
| C 405 | ECEA1CS331 |
| C 406 | ECKD1H103ZF |
| C 407 ⚠ | ECEA1ES222 |
| C 408 ⚠ | ECEA1ES101 |
| C 409 | ECKD1H103ZF |
| C 410 | ECEA50Z1 |
| C 411 | ECEA1CS331 |
| C 412 | ECKD1H103ZF |
| C 413 [A] [For Australia.] | ECQP1103JZ |
| C 414 ⚠ | ECEA1CS471 |
| C 415, 416 ⚠ | ECEA1CS472 |
| C 417, 418 ⚠ | ECEA1HS100 |
| C 419 | ECKD1H103ZF |
| C 420 [A] [For Australia.] | ECQP1103JZ |
| C 421 | ECEA1ES470 |
| C 422 | ECEA1ES220 |
| C 423 | ECEA1ES470 |
| C 424 | ECEA1ES220 |
| C 425, 426 | ECFDD104KZY |
| C 427 | ECEA50Z3R3 |
| C 428, 430 | ECFDD104KZY |
| C 431 ⚠ | ECEA1CS472 |
| C 435 | ECKD1H103ZF |
| C 502 | ECKD1H102MD |
| C 503 | ECCD1H331K |
| C 504 | ECEA1AS221 |
| C 505 | ECKD1H332ZF |
| C 506 | ECEA50ZR2R2 |
| C 507 | ECKD1H222MD |
| C 508 | ECEA1CN100 |
| C 511 | ECEA50ZR1 |
| C 702 | ECCD1H390JC |
| C 703 | ECCD1H101JC |
| C 704 | ECCD1H470JC |
| C 705 | ECKD1H102KB |
| **COMBINATION PARTS** | |
| Z 501 | EXBEQ5273K |
| Z 502 | EXBD86181K |
| Z 503 | EXBEQ4272K |
| Z 504 | QCRFWA1 |
| Z 505 | EXFP4472Z |
| Z 506 | EXBD8825K |
| Z 507 | EXRP152K473T |

| Ref. No. | Part No. |
|---|---|
| **TRANSISTORS** | |
| Q 1, 2 | 2SD636 |
| Q 3 | 2SB641 |
| Q 11, 12, 13, 14 | 2SK104F |
| Q 15, 16 | 2SD965 |
| Q 17, 18 | 2SD965 |
| Q 19 | 2SA921S |
| Q 21, 22, 23 | 2SD1011S |
| Q 25 | 2SB643 |
| Q 26 | 2SD946 |
| Q 27 | 2SD592NCR |
| Q 28, 29, 30, 31 | 2SD636 |
| Q 32 | 2SB641 |
| Q 33, 34, 35, 36, 37, 38, 39, 41, 42 | 2SD636 |
| Q 201, 202 | 2SK104F |
| Q 203, 204 | 2SD636 |
| Q 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220 | 2SD1010 |
| Q 221, 222, 223 | 2SD636 |
| Q 225 | 2SB641 |
| Q 227 | 2SD636 |
| Q 301, 302 | 2SD636 |
| Q 303, 304 | 2SB641 |
| Q 401 | 2SD836 |
| Q 402 | 2SC945Q |
| Q 403 | 2SA564 |
| Q 404 | 2SB895 |
| Q 405 | 2SD946 |
| Q 406 [A] [For Australia.] | 2SC945P |
| Q 407 | 2SD592NCR |
| Q 408 | 2SA683 |
| Q 501, 502, 503, 504, 505 | 2SB643 |
| Q 506 | 2SD636 |
| Q 508 | 2SD965 |

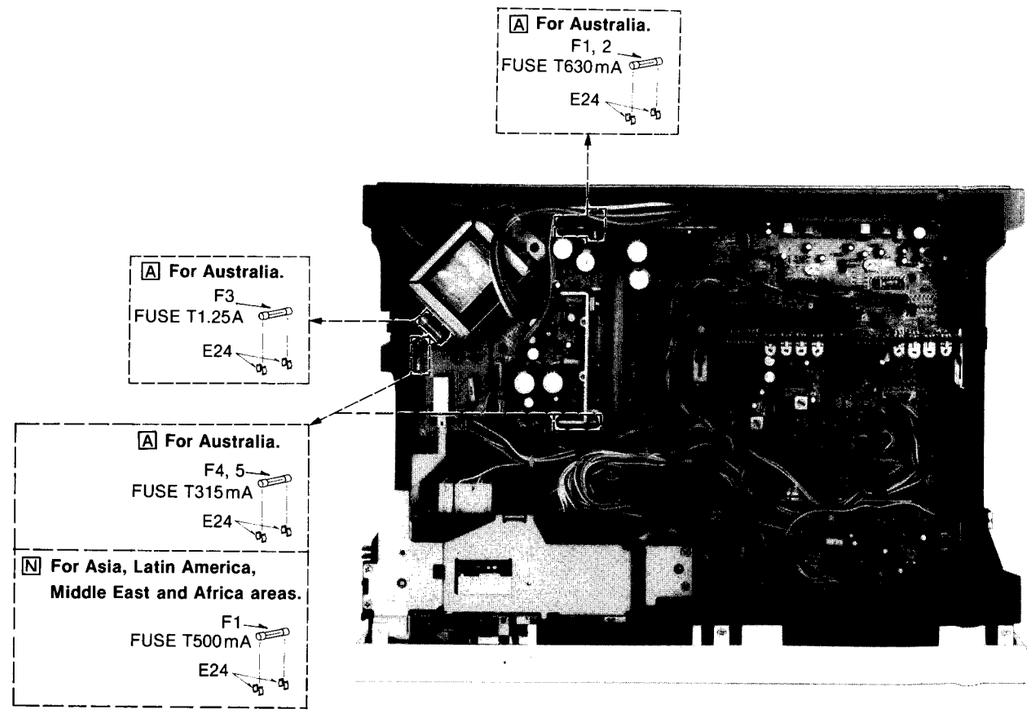
| Ref. No. | Part No. |
|---|---|
| **DIODES & RECTIFIERS** | |
| D 1, 2, 11, 12, 13, 14, 15 | MA161 |
| D 16 | RVDRD6R2EB |
| D 17, 18, 19, 20, 21, 22, 201, 202, 203, 204, 301, 302, 303, 305, 306 | MA161 |
| D 401, 402, 403, 404, 405, 406, 407, 408, 409 | ⚠ SM112 |
| D 410, 411 | MA1056 |
| D 412, 413 | MA161 |
| D 414, 415 | MA1150 |
| D 416 | MA1033 |
| D 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514 | MA161 |
| D 515 | LN41YPHL |
| D 516 | LN31GPHL |
| D 517 | LN21RPHL |
| D 702 | TLR208 |
| D 703 | TLG208 |
| D 704 | TLY208 |
| **INTEGRATED CIRCUITS** | |
| IC 1, 2 | AN6212 |
| IC 3, 4 | NE646N |
| IC 5, 6 | AN6213 |
| IC 7 | AN6256 |
| IC 8 | AN6214 |
| IC 9 | BA336 |
| IC 201, 202 | UPC1252H |
| IC 203, 204 | UPC1253H2 |
| IC 205, 206 | NJM4558DF |
| IC 301 | AN6870N |
| IC 302, 303 | AN6280 |
| IC 304 | NJM4556D |
| IC 305 | BA6138 |
| IC 501 | MN1405RH |
| IC 502 | AN6270 |
| IC 503 | DN6838 |
| IC 701 | M54816P |

| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| **ELECTRICAL PARTS** | | |
| E 1 | QWY4123Z | Record/Playback Head |
| E 2 | QWY2138Z | Erase Head |
| E 3 [N] ⚠ [For Asia, Latin America, Middle East and Africa areas.] | RJA52YAK | AC Power Cord |
| [A] ⚠ [For Australia.] | SJA23 | AC Power Cord |
| E 4 [N] [For Asia, Latin America, Middle East and Africa areas.] | QTD1129 | Cord Bushing |
| [A] [For Australia.] | QTD1164 | Cord Bushing |
| E 5 | QMA4402 | dbx P.B. Holder |
| E 6 | XTN3+16B | Tapping Screw ⊕3×16 |
| E 7 | XTN3+10B | Tapping Screw ⊕3×10 |
| E 8 | XTN3+8B | Tapping Screw ⊕3×8 |
| E 9 | XTS3+12B | Tapping Screw ⊕3×12 |
| E 10 | XTB3+10BFN | Tapping Screw ⊕3×10 |
| E 11 | QTD1181 | Wire Clamper |
| E 12 | QEJ5003S | Jack Board |
| E 13 | QJP1921TN | 3 Pin Post |
| E 14 | QJP1922TN | 6 Pin Post |
| E 15 | QJP1923TN | 9 Pin Post |
| E 16 | QJP1924TN | 12 Pin Post |
| E 17 | QJS1924TNL | 12 Pin Socket |
| E 18 [N] ⚠ [For Asia, Latin America, Middle East and Africa areas.] | QCR0008 | Spark Killer |
| [A] ⚠ [For Australia.] | QCR0011 | Spark Killer |
| E 19 | SJT777 | Pin Terminal |
| E 20 | XTN3+8B | Tapping Screw ⊕3×8 |
| E 21 | QMA4364 | Switch Angle |
| E 22 | XSN3+8S | Screw ⊕3×8 |
| E 23 | XWA3B | Washer |
| E 24 [N] ⚠ [For Asia, Latin America, Middle East and Africa areas.] | QTF1007 | Fuse Holder |
| [A] ⚠ [For Australia.] | QTF1054 | Fuse Holder |
| E 25 | QJS12001T | 12 Pin Socket |
| E 26 | XTN3+10B | Tapping Screw ⊕3×10 |

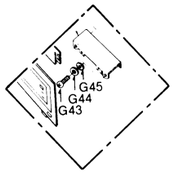
| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| E 27 | QJT0015 | Lug Terminal |
| E 28 | QTH1164 | Heat Sink |
| E 29 | XSN3+8S | Screw ⊕3×8 |
| E 30 | XWA3B | Washer 3⌀ |
| E 31 | XWE3 | Washer 3⌀ |
| E 32 | N024B | Insulator Plate |
| E 33 | N018E | Insulator Plate |
| E 34 | QSIFM004F | FL Meter |
| E 35 | QJT1067 | Check Pin |
| E 36 | QKJ0520 | LED Holder-A |
| E 37 | QJS15001T | 15 Pin Socket |
| E 38 | QKJ0521 | LED Holder-B |
| E 39 | QJC0050 | Earth Plate |
| E 40 | QMA4365 | Timer Angle |
| E 41 | XTN3+6B | Tapping Screw ⊕3×6 |
| E 42 | XAMQ44P300 | Pilot Lamp |
| E 43 | QJS06001T | 6 Pin Socket |
| E 44 | QJP06S001T | 6 Pin Post |
| E 45 | QJP12L001T | 12 Pin Post (L-type) |
| E 46 | QJP15L001T | 15P Post (L-type) |
| E 47 | QNQ1070 | Nut |
| E 48 | QNQ1039 | Nut |
| E 49 | QNQ1004 | Nut |
| E 50 | QJS1923TN | 9 Pin Socket |
| E 51 | QJS1922TN | 6 Pin Socket |
| E 52 | QJS1921TN | 3 Pin Socket |
| E 53 | QJT1054 | Contact |
| E 54 | XTN3+10BFN | Tapping Screw ⊕3×10 |
| E 55 | QJi1466RR | Leaf Switch Circuit Board |
| E 56 | QJT1089 | Contact |
| **RESONATOR** | | |
| X 701 | QZE0049 | Crystal |
| **COILS** | | |
| L 1, 2 | QLQX0332KWA | Peaking Coil |
| L 3, 4 | QLQX0343KWA | Bias Trap Coil |
| L 5, 6 | QLM9Z9K | MPX Filter |
| L 8 | QLQX0332KWA | Peaking Coil |
| L 501 | ELEH101KA | Choke Coil |
| L 502, 503 | QLQZ1014D | Choke Coil |
| **TRANSFORMERS** | | |
| T 1 | QLB0198K | Bias Oscillation Coil |
| T 401 ⚠ | QLPN74EMX | AC Power Transformer |
| **FUSES** | | |
| F 1 [N] ⚠ [For Asia, Latin America, Middle East and Africa areas.] | XBA2E05NS5 | Fuse (T 500mA) |
| F 1, 2 [A] ⚠ [For Australia.] | XBAQ0008 | Fuse (T 630mA) |
| F 3 [A] ⚠ [For Australia.] | XBAQ125028 | Fuse (T 1.25A) |
| F 4, 5 [A] ⚠ [For Australia.] | XBA0006 | Fuse (T 315mA) |
| **SWITCHES** | | |
| S 1 | QSR8402 | Rotary Switch (NR Selector) |
| S 401 ⚠ | QSW1117AS | Push Switch (Power ON/OFF) |
| S 402 ⚠ | QSR1407 | Rotary Switch (Voltage Selector) |
| S 501, 502, 503, 504, 505, 506, 507, 508 | QSW1118 | Key Board Switch |
| S 509, 510, 511, 512 | QSWY409 | Push Switch |
| S 513 | QSS1303 | Slide Switch (Timer Switch) |
| S 601 | QSB0260 | Leaf Switch (Erase Safety Switch) |
| S 602 | QSB0260 | Leaf Switch (Mode Sensing Switch) |
| S 603 | QSB0261 | Leaf Switch (Stop Switch) |
| S 604 | QSB0260 | Leaf Switch (Playback Switch) |
| S 605 | QSB0261 | Leaf Switch (Half Detection Switch) |
| S 606, 607 | QSB0266 | Leaf Switch (Auto Tape Selector) |
| **JACKS** | | |
| J 1 | QJA0259 | Headphones Jack |
| J 2 | QJA0262 | Microphone Jack |

| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| **MECHANICAL PARTS** | | |
| M 1 | QMA4330 | Flywheel Retainer |
| M 2 | QBP1894 | Head Base Plate Spring |
| M 3 | QBP1895 | Cassette Pressure Spring |
| M 4 | QXG1059 | Main Gear |
| M 5 | QDR1146 | Supply Reel Table |
| M 6 | QMB1336 | Reel Table Hub |
| M 7 | QML3655 | Cam Follower |
| M 8 | QML3660 | Idler Select Lever |
| M 9 | QML3661 | Erase Safety Lever |
| M 10 | QMZ1283 | Flywheel Thrust Retainer |
| M 11 | QDB0306 | Capstan Belt |
| M 12 | QDB0287 | Reel Motor Belt |
| M 13 | QDK1012 | Steel Ball |
| M 14 | QBW2008 | Snap Washer |
| M 15 | QBW2046 | Snap Washer |
| M 16 | QBN1772 | Erase Safety Lever Spring |
| M 17 | QBT1725 | Lock Lever Spring |
| M 18 | QBT1927 | Head Base Plate Spring |
| M 19 | QBT1920 | Idler Spring |
| M 20 | QBC1373 | Reel Table Spring |
| M 21 | XTN2+6B | Tapping Screw ⊕2×6 |
| M 22 | XTN26+6BFZ | Tapping Screw ⊕2.6×6 |
| M 23 | XTN3+24B | Tapping Screw ⊕3×24 |
| M 24 | XUB4FT | Stop Ring |
| M 25, 26 | XTN3+10B | Tapping Screw ⊕3×10 |
| M 27 | XTN26+8B | Tapping Screw ⊕2.6×8 |
| M 29 | QXD0120 | Takeup Reel Table Assembly |
| M 30 | QMK1867 | Head Base Plate |
| M 31 | QMZ1252 | Head Spacer |
| M 32 | QBC1103 | Head Spring |
| M 33 | XSN2+16 | Screw ⊕2×16 |
| M 34 | XWG2 | Washer 2⌀ |
| M 35 | QXA1232 | Brake Plunger Assembly |
| M 36 | QML3865 | Plunger Lever |
| M 37 | QBT1955 | Plunger Spring |
| M 38 | QXA1222 | Side Angle Spring |
| M 38-1 | QBT1755 | Side Angle Spring |
| M 39 | QXA1076 | Trigger Plunger Assembly |
| M 40 | QML3651 | Trigger Plunger Lever |
| M 41 | QML3653 | Control Lever |
| M 42 | QBT1278 | Record Lock Lever Spring |
| M 45 | QXU0280 | Capstan Motor Assembly |
| M 46 | QXA1077 | Motor Retainer Assembly |
| M 47 | QDB0286 | Takeup Belt |
| M 48 | QXP0621 | Takeup Pulley |
| M 49 | XSN26+3 | Screw ⊕2.6×3 |
| M 50 | QXU0250 | Reel Motor Assembly |
| M 51 | QBN1878 | Holder Spring |
| M 52 | QBP1946 | Cassette Lock Spring |
| M 53 | QXL1406 | Pressure Roller Lever |
| M 53-1 | QBN1771 | Pressure Roller Spring |
| M 54 | QMN2625 | Eccentric Pin |
| M 55 | QXL1423 | Idler Lever Assemlbly |
| M 56 | QXi0116 | Takeup Idler |
| M 57 | QXL1408 | Swing Gear Lever Assembly |
| M 58 | QXL1409 | Fast Wind Arm Assemlby |
| M 59 | QML3659 | Brake Lever |
| M 60 | QBG1132 | Brake Rubber |
| M 61 | QXL1411 | Lock Lever Assembly |
| M 62 | QXF0190 | Flywheel Assembly |
| M 63 | QMA4358 | Center Angle |
| M 64 | QMA4359 | Side Angle-R |
| M 65 | XTN3+8B | Tapping Screw ⊕3×8 |
| M 66 | XTN26+6BFZ | Tapping Screw ⊕2.6×6 |
| M 68 | XTN26+10B | Tapping Screw ⊕2.6×10 |
| M 69 | QXH0390 "Silver Type" | Mechanism Cover |
| | QXH0390K "Black Type" | Mechanism Cover |
| M 70 | QBT1691 | Lamp Lever Spring-B |
| M 71 | QBT1566 | Intermediate Lever Spring |
| M 72 | QXL1414 | Lock Lever-A |
| M 73 | QXL1507 | Lock Lever-B |
| M 74 | XUC25FT | Stop Ring |
| M 75 | QXR0780 | Eject Rod Assembly |
| M 76 | QKJ0499 | Dumper Gear Holder |
| M 77 | QDG1254 | Dumper Gear |
| M 78 | XNG26 | Nut |
| M 79 | XSN26+8B | Screw ⊕2.6×8 |
| M 80 | QMH2085 "Silver Type" | Cassette Holder |
| | QMH2085K "Black Type" | Cassette Holder |
| M 81 | XWG26 | Washer 2.6⌀ |
| M 82 | QMA4072 | Auto Tape Selector Angle |
| M 83 | QML3716 | Tape Detection Lever (for Normal/$CrO_2$ Tape) |
| M 84 | QML3717 | Tape Detection Lever (for Metal Tape) |
| M 85 | QNM2642 | Detection Lever Shaft |
| M 86 | XTN2+6B | Tapping Screw ⊕2×6 |
| M 87 | XWG3 | Washer 3⌀ |
| M 88 | XWG26 | Washer 2.6⌀ |
| M 89 | XTN26+12B | Tapping Screw ⊕2.6×12 |
| M 90 | XTN3+6B | Tapping Screw ⊕3×6 |
| M 91 | XTN26+5B | Tapping Screw ⊕2.6×5 |
| **CABINET PARTS** | | |
| G 1 | QGCM0058 "Silver Type" | Case Cover |
| | QGCM0058K "Black Type" | Case Cover |
| G 2 | QKA1086 | Case Foot |
| G 3 | QGK3201 "Silver Type" | Side Board |
| | QGK3201K "Black Type" | Side Board |
| G 4 | QBG1736 | P.B Cushion |
| G 5 | QGK3223D "Silver Type" | Meter Cover |
| | QGK3223K "Black Type" | Meter Cover |
| G 6 | QGL1174 | Filter |
| G 7 | QYB0411 | Button Cover Assembly |
| G 8 | QYP1084 "Silver Type" | Front Panel Assembly |
| | QYP1085 "Black Type" | Front Panel Assemlbly |
| G 9 | QGK3222B "Silver Type" | Operation Panel |
| | QGK3222K "Black Type" | Operation Panel |
| G 10 | QKJ0518 | Push Button Holder |
| G 11 | QXB0758 | Operation Button (Play) |
| G 12 | QXB0759 | Operation Button (Pause) |
| G 13 | QXB0760 | Operation Button (Record) |
| G 14 | QGO1990 "Silver Type" | Operation Button (Rec-Mute) |
| | QGO1990Y "Black Type" | Operation Button (Rec Mute) |
| G 15 | QGO1991 "Silver Type" | Operation Button (Fast Forward) |
| | QGO 1991Y "Black Type" | Operation Button (Fast Forward) |
| G 16 | QGO1993 "Silver Type" | Operation Button (Rewind) |
| | QG01993Y "Black Type" | Operation Button (Rewind) |
| G 17 | QGO1994 "Silver Type" | Operation Button (Stop) |
| | QG01994Y "Black Type" | Operation Button (Stop) |
| G 18 | QGO1995 | Push Button (Counter Reset) |
| G 19 | QYF0542 "Silver Type" | Cassette Lid Assembly |
| | QYF0542K "Black Type" | Cassette Lid Assembly |
| G 20 | QYT0636 | Volume Knob-R |
| G 21 | QYT0637 | Volume Knob-L |
| G 22 | QGT1569 | Select Knob |
| G 23 | QGO2043 | Function Button |
| G 24 | QGO2042 | Timer Buttom |
| G 25 | QGO1900 | Power Button |
| G 26 | QMR1986 | Power Rod |
| G 27 | QJC0049 | Earth Plate-A |
| G 28 | QTS1576 | Meter Shield Plate |
| G 29 | QKM1512 | Main Case Assembly |
| G 30 | QMK1959 | Sub Chassis |
| G 31 | QTW1279 | Meter Insulating Plate |
| G 32 | XTB4+10BFN | Screw ⊕4×10 |
| G 33 | QTS1575 | Microphone Shield Plate |
| G 34 | QMA4363 | Volume Angle |
| G 35 [N] [For Asia, Latin America, Middle East and Africa areas.] | QGS2985 | Main Name Plate |
| [A] [For Australia.] | QGS2975 | Main Name Plate |
| G 36 | QBH2012 | Cover Cushion |
| G 38 | XTN3+10B | Tapping Screw ⊕3×10 |
| G 39 | XTS3+12B | Tapping Screw ⊕3×12 |
| G 40 | XWE3 | Washer |
| G 41 | XTN26+10B | Tapping Screw |
| G 42 | XTN3+12B | Tapping Screw |
| G 43 | QTS1579 | Shield Plate |
| G 44 | XSN3+8S | Screw ⊕3×8 |
| G 45 | XWA3B | Washer |
| **ACCESSORIES** | | |
| A 1 | RP023A | Connection Cord |
| A 2 [N] [For Asia, Latin America, Middle East and Africa areas.] | QQT3266 | Instruction Book |
| [A] [For Australia.] | QQT3268 | Instruction Book |
| **PACKINGS** | | |
| P 1 | QPN4290 | Inside Carton |
| P 2 | QPA0654 | Cushion-A |
| P 3 | QPA0655 | Cushion-B |
| P 4 | XZB50X65A02 | Poly Bag |
| P 5 | QPS0618 | Pad |
| P 6 | QPC0072 | Sheet |
| P 7 | QPA0662 | Spacer |

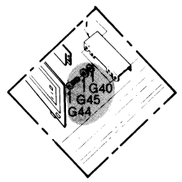
# ELECTRICAL PARTS LOCATION



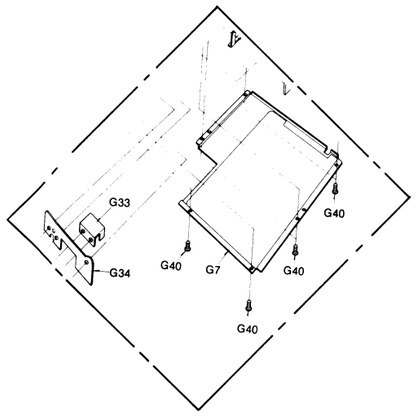
# CABINET PARTS LOCATION




D ...For all European areas.




AN ...For Australia, Asia, Latin America, Middle East and Africa areas.

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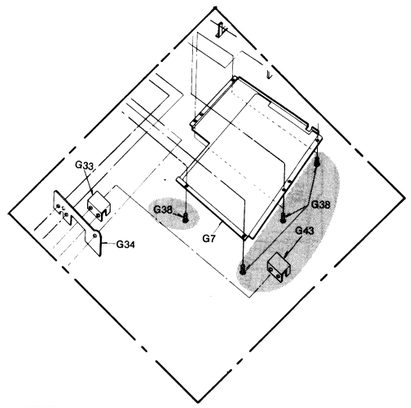
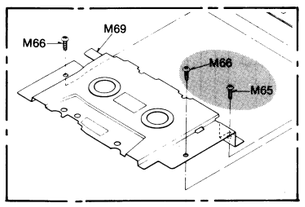
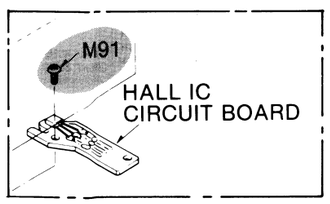



AN ...For Australia, Asia, Latin America, Middle East and Africa areas.

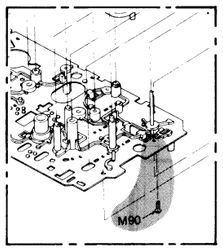
# MECHANISM PARTS LOCATION
## (DIFFERENCE)

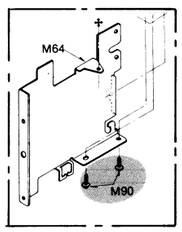
**Front Side**

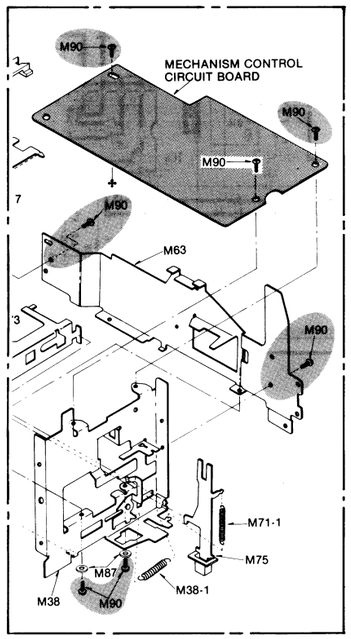



**Rear Side**

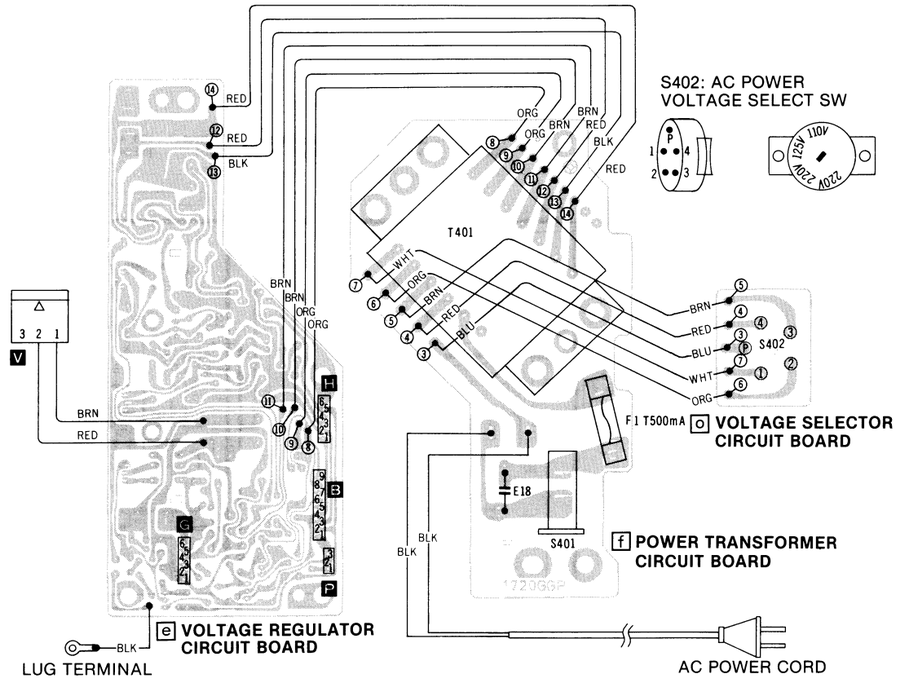


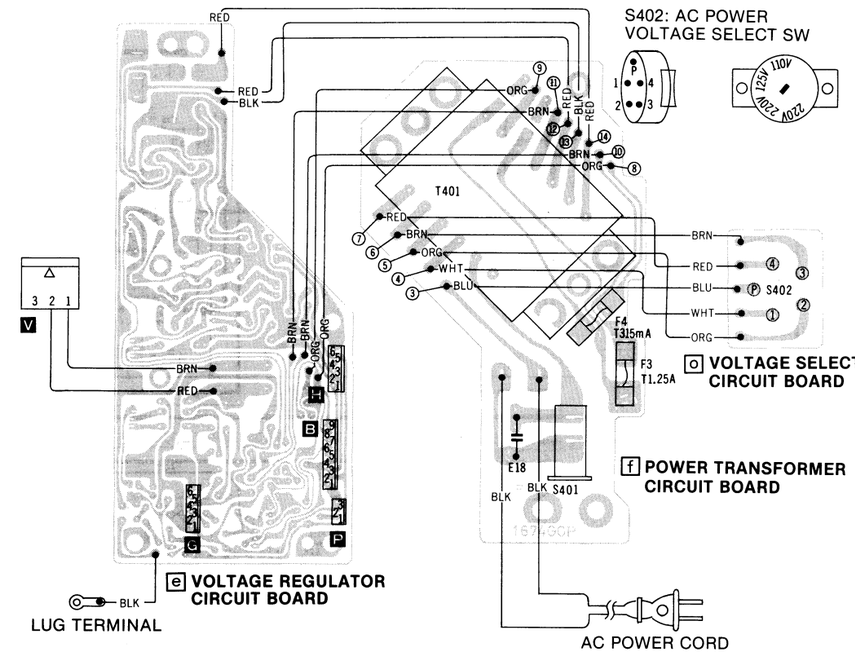






# WIRING CONNECTION DIAGRAM




* For Asia, Latin America, Middle East and Africa areas.




* For Australia.

**NOTES:**

| | |
|---|---|
| BLK | Black |
| BLU | Blue |
| BRN | Brown |
| GRY | Gray |
| GRN | Green |
| L. BLU | Light Blue |
| NIL | No Color Mark |
| ORG | Orange |
| PNK | Pink |
| RED | Red |
| SLD | Shield Wire |
| VLT | Violet |
| WHT | White |
| YEL | Yellow |

# SCHEMATIC DIAGRAM

## MAIN SECTION

NOTES:

- ( ▬▶▬ ) indicates B + (bias).
- ( ▬◀▬ ) indicates B − (bias).
- ( ▬▬ ) indicates the flow of the playback signal (dbx out).
- ( ▬▬ ) indicates the flow of the playback signal (dbx tape).
- ( ▬▶▬ ) indicates the flow of the recording signal (dbx out).
- ( ▬◀▬ ) indicates the flow of the recording signal (dbx tape).

○ Voltage values shown in MAIN SECTION.
NO MARK. . . . Voltage values at out (NR select switch) mode
( ) . . . . . Voltage values at record mode.
[ ] . . . . . Voltage values at disc (NR select switch) mode

a MAIN CIRCUIT BOARD

Q41, 42 2SD636(R,S,T) [2SD636] · Q1, 2 2SD636RST [2SD636] · Q3 2SB641(R,S,T) [2SB641] · Q28, 29 2SD636(R,S,T) [2SD636] · IC1, 2 [AN6212] · D11 QVD1S2473T [MA161] · D17 QVD1S2473T [MA161] · D1 QVD1S2473T [MA161] · IC3, 4 [NE646N] · Q32 2SB641(Q,R,S,T) [2SB641] · Q30 2SD636(R,S,T) [2SD636] · Q33 [2SD636] · Q11, 13 [2SK104F] · D12, 13 QVD1S2473T [MA161] · IC5, 6 [AN6213] · Q31 2SD636(R,S,T) [2SD636] · D22 QVD1S2473T [MA161]

b LED CIRCUIT BOARD

D702 [TLR208] · D703 [TLG208] · D704 [TLY208]

Auto Input Select · Q19 2SA921(R,S) [2SA921S] · Q21, 22, 23 2SD1011(R,S,T) [2SD1011S] · Q15, 16, 17, 18 [2SD965] · LCH LINE IN · LCH MIC IN · RCH MIC IN · RCH LINE IN · Head Change over Control · LCH RECORD/PLAY BACK HEAD (QAW4123Z) · RCH · ERASE HEAD (QAY2138Z) · PB EQ &Mic Amp · Dolby NR · dbx (LCH) · dbx (RCH) · En/De Control · Rec EQ & Line Amp · Rec PB & Muting Control · Auto Tape Selector · Music Selector · Bias OSC · Connection Point (A) · Connection Point (B) · S1-1 S1-2 S1-3 S1-4 S1-5 S1-6 S1-7 S1-8 · S606 (Normal)/(CrO2) S607 (Metal) · A.T.S. · LCH LINE OUT · RCH LINE OUT · Head Phones J3

c HEADPHONES CIRCUIT BOARD

S TO MECHANISM CONTROL CIRCUIT BOARD: POF · GND · RMT · DMT · REC · PLAY · C/R · MPS

C TO FL METER CIRCUIT BOARD: LCH · RCH · RMM · Jbar · GND

H TO POWER CIRCUIT BOARD: POS · +10.5V · GND · −10.5V

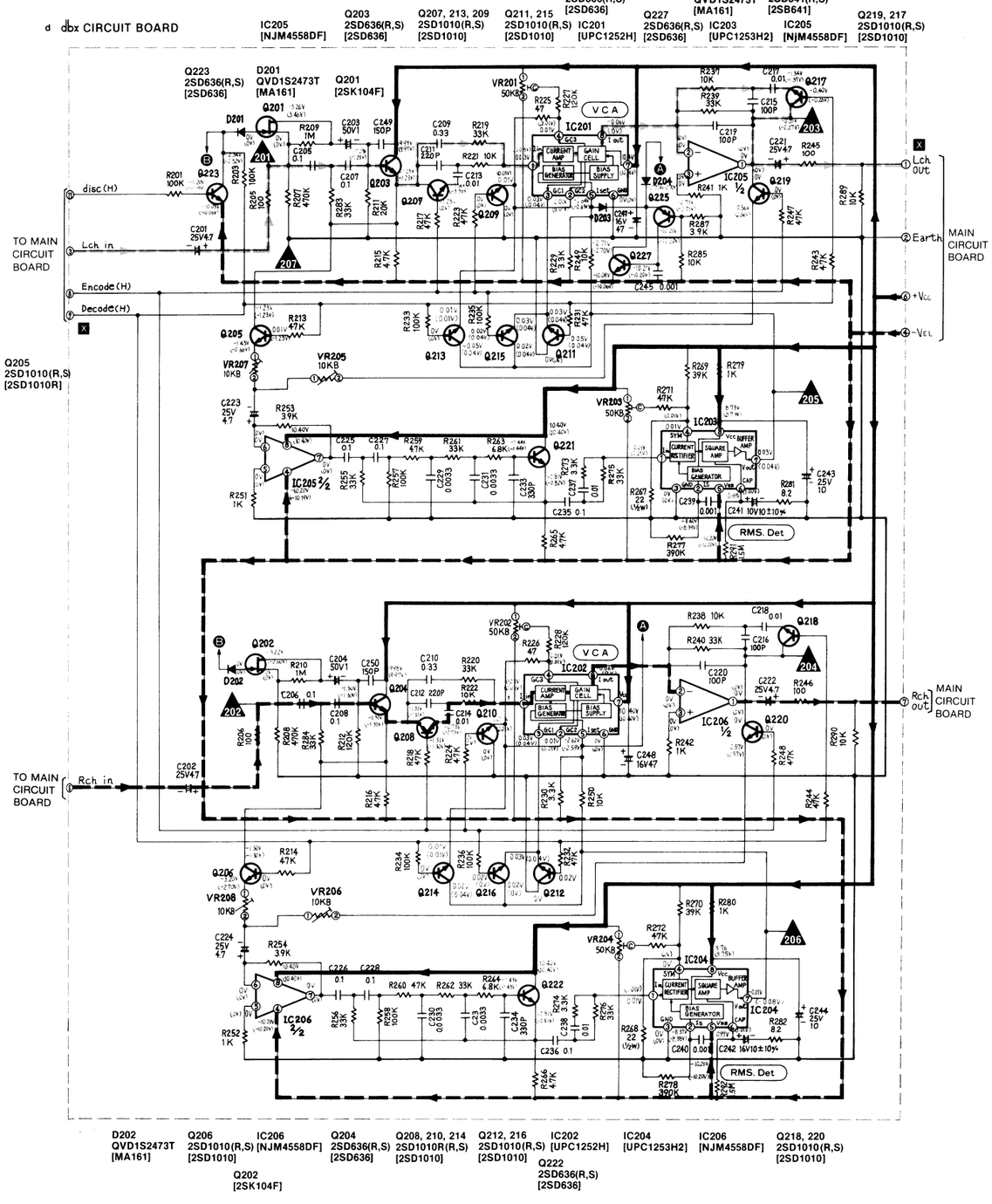
Q27 2SD592ANCRS [2SD592NCR] · Q26 [2SD946] · Q14, 15 QVD1S2473T [MA161] · Q25 2SB643(R,S) [2SB643] · Q39 2SD636(R,S,T) [2SD636] · D18 QVD1S2473T [MA161] · Q19 QVD1S2473T [MA161] · IC9 [BA336] · Q37, 38 2SD636(R,S,T) [2SD636] · IC7 [AN6256] · IC8 [AN6214] · Q34, 35, 36 2SD636(R,S,T) [2SD636] · D20, 21 QVD1S2473T [MA161] · D16 MA1062LTA or MA1062MTA or MA1062HTA [RVDRD6R2EB]

NOTES:

○ Voltage values shown in dbx SECTION.
( ) ..... Voltage values at out (NR select switch) mode.
[ ] ..... Voltage values at disc (NR select switch) mode.
For measurement use VTVM.

## dbx SECTION

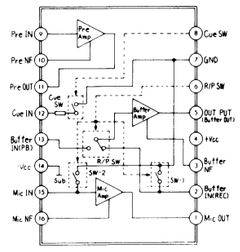
d dbx CIRCUIT BOARD



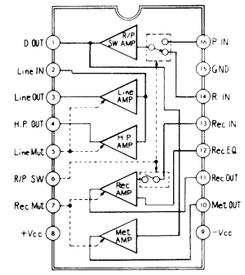



## EQUIVALENT CIRCUITS

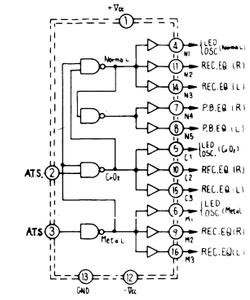
### IC1,2 AN6212



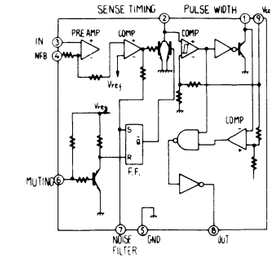
### IC5,6 AN6213



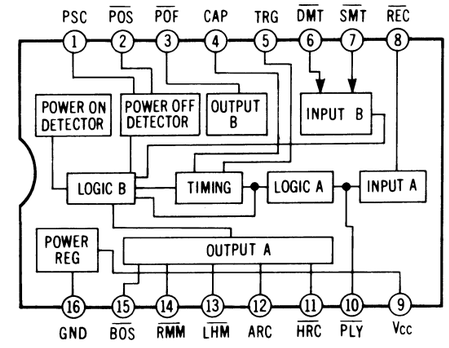
### IC7 AN6256



### IC9 BA336



### IC8 AN6214




■ **Truth table of IC1, 2** (Postive)

R / P SW

| ⑥pin | Operation |
|---|---|
| H | REC |
| L | PB |

SW-1, SW-2

| ⑥pin | Operation |
|---|---|
| H | —— |
| L | Mute |

Cue SW

| ⑧pin | Operation |
|---|---|
| H | —— |
| L | Cue |

■ **Truth table of IC5, 6** (Positive)

R / P SW

| ⑥pin | Operation |
|---|---|
| H | REC |
| L | PB |

Muting

| ⑤, ⑦Pin | Operation |
|---|---|
| H | Muting OFF |
| L | Muting ON |

L : GND Level

SPECIFICATIONS

* Input level controls ··· MAX
* Output level control ··· MAX

| | |
|---|---|
| Playback S/N ratio<br>* Test tape ··· QZZCFM | Greater than 45 dB |
| Overall distortion<br>* Test tape<br>··· QZZCRA for Normal<br>··· QZZCRX for $CrO_2$<br>··· QZZCRZ for Metal | Less than 4 % |
| Overall S/N ratio<br>* Test tape ··· QZZCRA | Greater than 43 dB<br>(without NAB filter) |

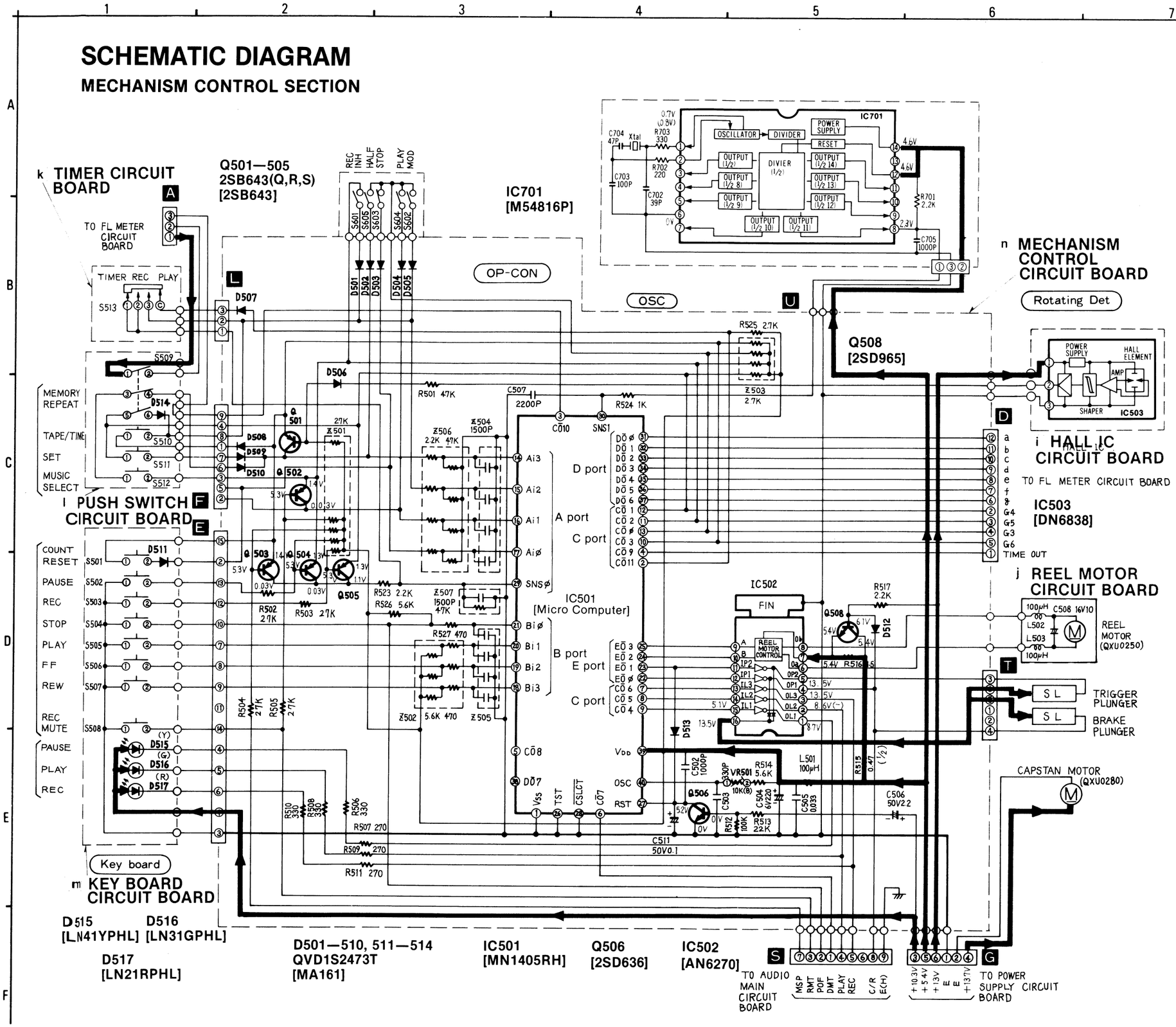
NOTES:
- S1-1—S1-8 ..... NR select switch (shown in OUT position: (1) Dolby NR, (2) OUT, (3) dbx tape, (4) dbx disc)
- S606 ..... Auto tape select switch (For Normal/$CrO_2$ tape)
- S607 ..... Auto tape select switch (For Metal tape)

| Mode | S606 | S607 |
|---|---|---|
| Normal | on | on |
| $CrO_2$ | on | off |
| Metal | off | off |

- VR1, 2. ..... Input level controls.
- VR3, 4. ..... Output level control.
- VR5, 6. ..... Playback gain adjustment VR.
- VR7, 8. ..... Recording gain adjustment VR.
- VR9, 10. ..... Bias current adjustment VR.
- VR201, 202. ..... VCA symmetry adjustment VR.
- VR203, 204. ..... RMS detector adjustment VR.
- VR205, 206. ..... dbx standard level adjustment VR (Encode).
- VR207, 208. ..... dbx standard level adjustment VR (Decode).
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000 (Ω), 1M = 1,000 k (Ω)
- Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.
- The mark (▼) shows test point. e.g. ▽ = test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes. One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  2SC1844 (E, F) ◄—Production parts number
  [2SC1844E] ◄——Supply parts number
  D212
  1S2473T77 ◄——Production parts number.
  [MA161] ◄——Supply parts numbers
- The supply parts number is described alone in the replacement parts list.
- **This schematic diagram may be modified at any time with the development of new technology.**

# SCHEMATIC DIAGRAM

## MECHANISM CONTROL SECTION




**NOTES:**

- VR501.... Input scanning time adjustment VR
- S501..... Counter reset switch
- S502..... Pause switch
- S503..... Record switch
- S504..... Stop switch
- S505..... Playback switch
- S506..... Fast Forward switch
- S507..... Rewind switch
- S508..... Record mute switch
- S509..... Memory repeat switch
- S510..... Tape/Time select switch
- S511..... Set switch
- S512..... Music select switch
- S513..... Timer switch (shown in REC position: (1) REC, (2) OFF, (3) PLAY)
- S601..... Accidental erase prevention switch
- S602..... Mode switch
- S603..... Stop switch
- S604..... Playback switch
- S605..... Cassette detection switch

  } Mode sensing switches

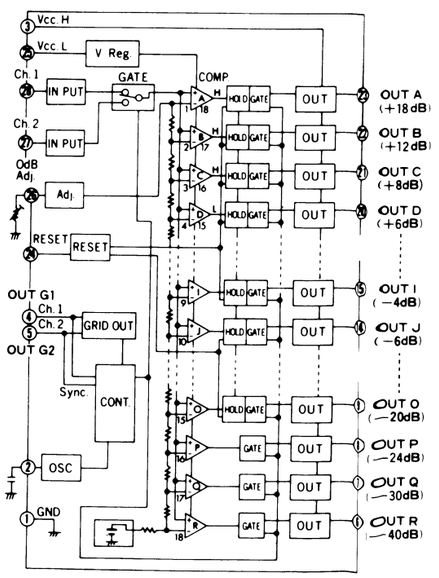
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. However, the voltae in record mode is indicated in ( ) when it differs from that in record mode. For measurement, use VTVM.
- ( ➡ ) indicates B + (bias)
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors are diodes. One type of number is used for supply parts number and production parts number when they are identical.

  e.g. Q1
  2SC1844(E,F) ◄ Production parts number
  [2SC1844E] ◄ Supply parts number
  D301
  QVD1S2473T ◄ Production parts number
  [MA161] ◄ Supply parts

- The supply parts number is described alone in the replacement parts list.
- **This schematic diagram may be modified at any time with the development of new technology.**

## EQUIVALENT CIRCUITS

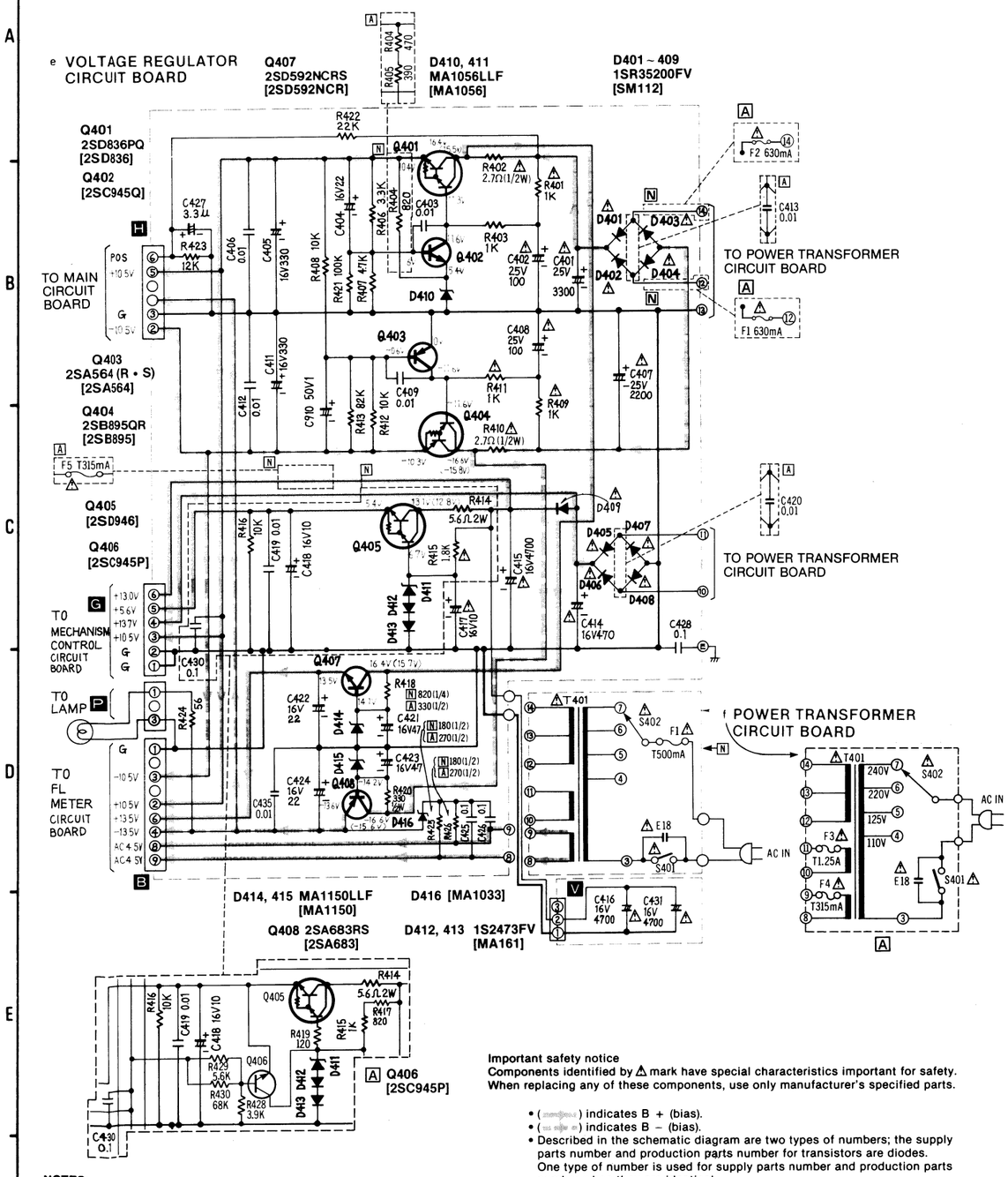
**IC301 AN6870**



# SCHEMATIC DIAGRAM

## POWER SUPPLY SECTION

NOTES:
N ...For Asia, Latin America, Middle East and Africa areas.
A ...For Australia.







**NOTES:**
- S401. . . . Power ON/OFF switch.
- S402 . . . . AC power voltage select switch.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. However, the voltage in record mode is indicated in ( ) when it differs from that in record mode. For measurement use VTVM.

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

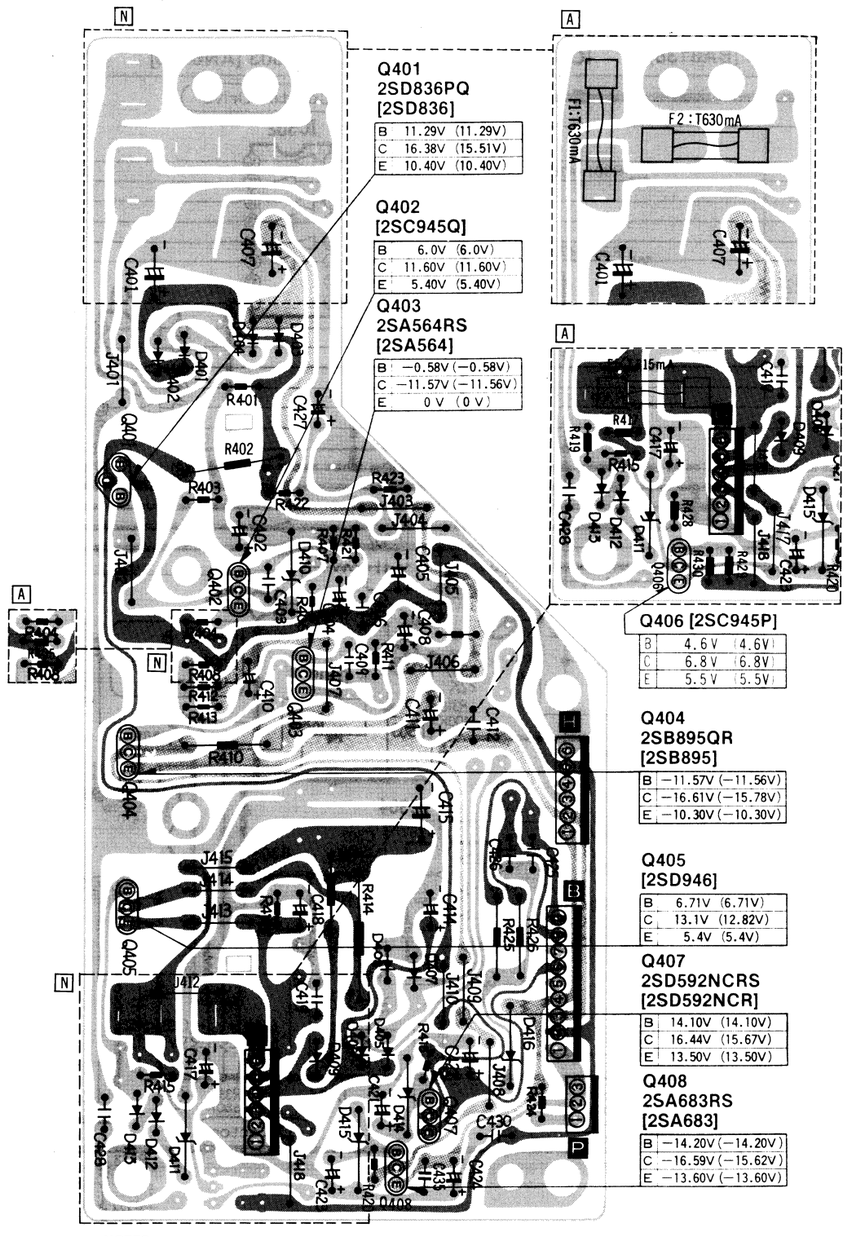
- ( ) indicates B + (bias).
- ( ) indicates B − (bias).
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors are diodes. One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  2SC1844(E,F) ◄ Production parts number
  [2SC1844E] ◄ Supply parts number
  D301
  QVD1S2473T ◄ Production parts number
  [MA161] ◄ Supply parts
- The supply parts number is described alone in the replacement parts list.
- **This schematic diagram may be modified at any time with the development of new technology.**



# CIRCUIT BOARD

## VOLTAGE REGULATOR CIRCUIT BOARD

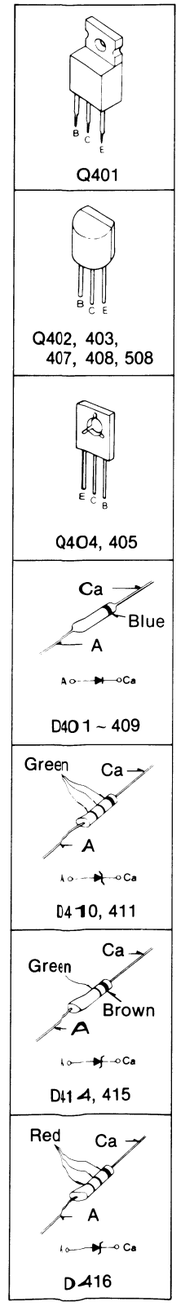
NOTES:
N ...For Asia, Latin America, Middle East and Africa areas.
A ...For Australia.




**NOTES:**
- The circuit shown in ▬ on the conductor is B + (bias) circuit.
- The circuit shown in ▬ on the conductor is B− (bias)circuit.
- The circuit shown in ▬ on the conductor side indicates printed circuit on the back side of the printed circuit board.
- Values indicated in ▭ are DC voltage between the ground and electrical parts.
- The voltage indicates are measured during playback mode. However, the voltage in record mode is indicates in ( ) when it differs from that in record mode.

- **This circuit board diagram may be modified at any time with the development of new technology.**

### TERMINATIONS

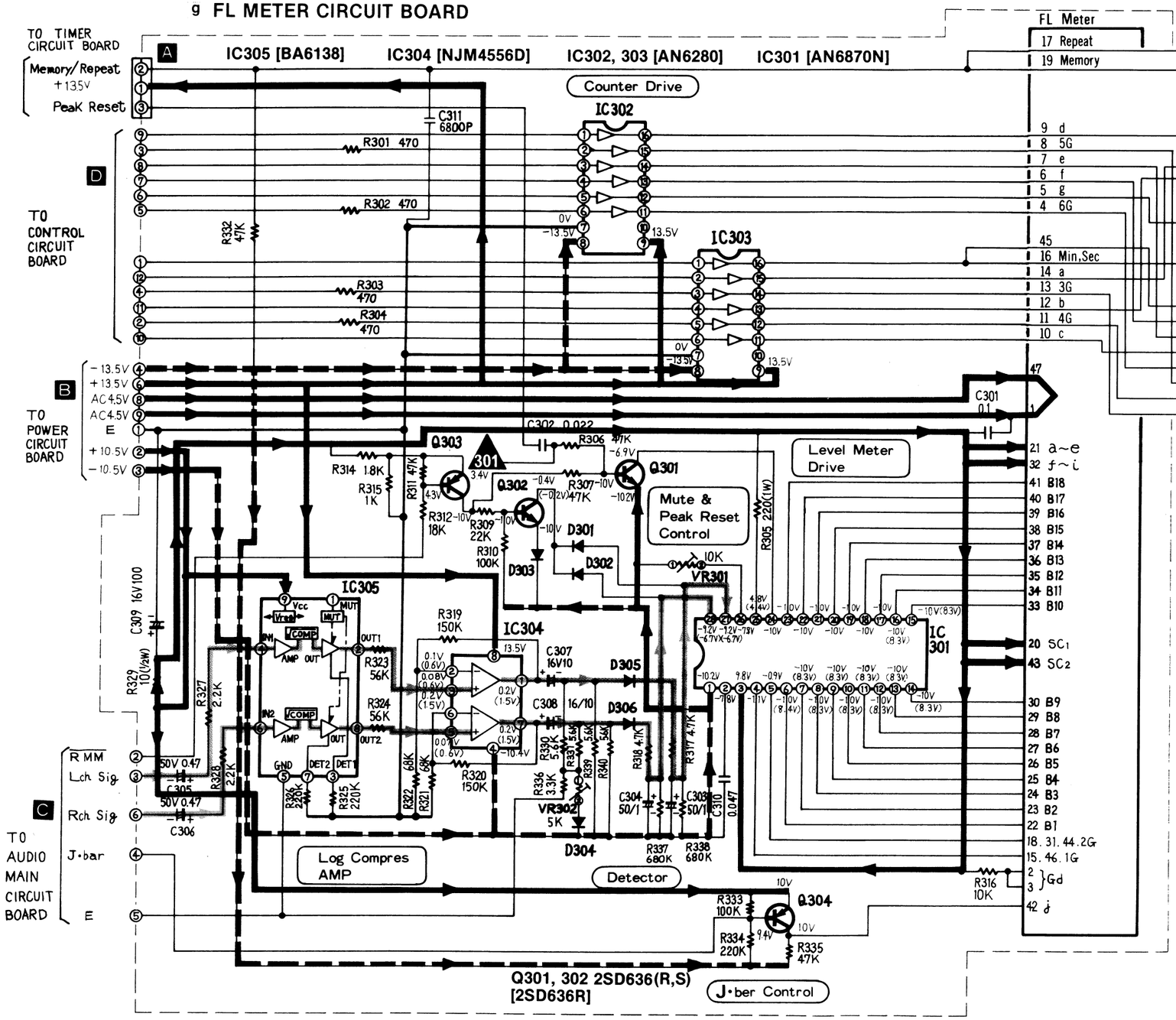





ARD N NK A
Y.F
Printed in Japan

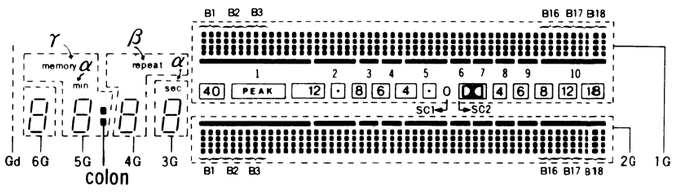
## FL METER SECTION

### g FL METER CIRCUIT BOARD




**D301—303 QVD1S2473T** [MA161] **305, 306**
**D304 1S2473FV** [MA161]
**Q303 2SB641(R,S)** [2SB641R]
**Q304 2SA564(R,S,T)** [2SA564R]

### GRID TERMINATION (FL METER)




**NOTES:**

- VR301. . . . FL meter adjustment VR (For 0 dB indication)
- VR302. . . . FL meter adjustment VR (For − 40 dB indication)
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in microfarads (μF) unless specified otherwise.
  P = Pico-farads.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position.
  However, the voltae in record mode is indicated in ( ) when it differs from that in record mode.
  For measurement, use VTVM.
- (▬) indicates B + (bias)
- (▬) indicates B − (bias)
- (▬) indicates the flow of the playback/recording signal.
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors are diodes.
  One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  2SC1844(E,F) ◄ Production parts number
  [2SC1844E] ◄ Supply parts number
  D301
  QVD1S2473T ◄ Production parts number
  [MA161] ◄ Supply parts
- The supply parts number is described alone in the replacement parts list.
- **This schematic diagram may be modified at any time with the development of new technology.**

ORDER NO. ARD82010116C2-29

# Service Manual

Cassette Deck

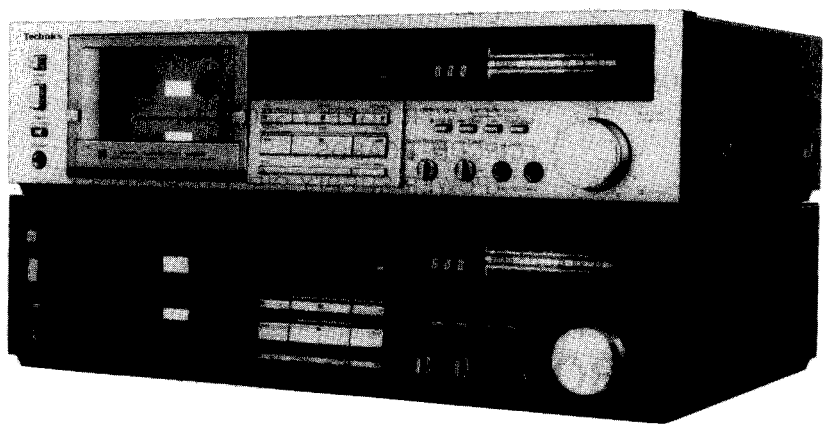
# RS-M255X

(Silver Face / Black Face)

**dbx** Equipped Cassette Deck with Electronic Multi-Mode Counter

DOLBY SYSTEM

This is the Service Manual for the following areas.
[D] ····· For all European areas except United Kingdom.
[B] ····· For United Kingdom.



## RS-M250 MECHANISM SERIES

## Specifications

| | |
|---|---|
| Track system: | 4-track 2-channel stereo recording and playback |
| Tape speed: | 4.8 cm/s |
| Wow and flutter: | 0.038% (WRMS), ±0.13% (DIN) |
| Frequency response: | Metal tape; 20 – 20,000 Hz<br>25 – 18,000 Hz (DIN)<br>30 – 17,000 Hz ±3 dB |
| | $CrO_2$ tape; 20 – 19,000 Hz<br>25 – 18,000 Hz (DIN)<br>30 – 16,000 Hz ±3 dB |
| | Normal tape; 20 – 18,000 Hz<br>25 – 16,000 Hz (DIN)<br>30 – 15,000 Hz ±3 dB |
| Dynamic range: | 110 dB (at 1 kHz) with dbx in |
| Max. input level improvement: | 10 dB or more improved with dbx in (at 1 kHz) |
| Signal-to-noise ratio: | dbx* in; 92 dB<br>Dolby** NR in; 68 dB (above 5 kHz)<br>Dolby NR out; 58 dB (signal level = max. input level A weighted, $CrO_2$ type tape) |
| Fast forward and rewind time: | Approx. 90 seconds with C-60 cassette tape |
| Inputs: | MIC; sensitivity 0.25 mV, applicable microphone impedance 400Ω – 10 kΩ<br>LINE; sensitivity 60 mV, input impedance 47 kΩ |
| Outputs: | LINE; output level 700 mV, load impedance 22 kΩ over<br>HEADPHONES; output level 125 mV (at 8Ω) |
| Bias frequency: | 85 kHz |
| Motor: | 2-motor system |
| Heads: | 2-head system<br>1-SX (Sendust Extra) head for record/playback<br>1-double-gap ferrite head for erasure |
| Power requirement: | AC; 110/125/220/240 V, 50-60 Hz<br>Pre-set power voltage 220 V<br>240 V for United Kingdom |
| Power consumption: | 28 W |
| Dimensions: | 43.0 cm(W) × 10.8 cm(H) × 33.1 cm(D) |
| Weight: | 6.0 kg |

Specifications are subject to change without notice.
* The term dbx is a registered trademark of dbx Inc.
** 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

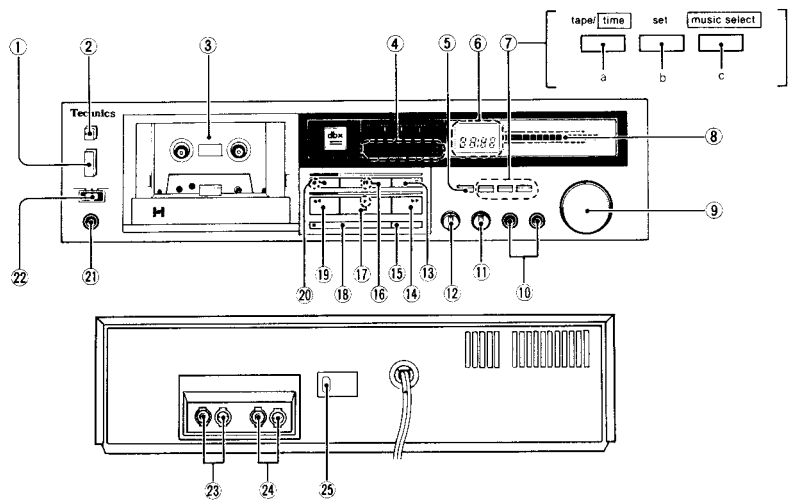
Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

# CONTENTS



# LOCATION OF CONTROLS AND COMPONENTS




① **Power switch [power (push on)]**
② **Eject button [eject]**
③ **Cassette holder**
④ **Tape indicator**
**[Auto Tape Select (Normal • $CrO_2$ • Metal)]**
⑤ **Memory repeat button [memory repeat (■ off • ▁ on)]**
⑥ **Digital multi counter [multi counter]**
⑦ **Counter mode select button [multi counter mode]**
ⓐ **Tape/time select button [tape/ time ]**
ⓑ **Set button [set]**
ⓒ **Music select button [ music select ]**
⑧ **FL (fluorescent level) meter**
⑨ **Input level controls [input level (L ⊖ R)]**
⑩ **Microphone jacks [mic (L • R)]**
⑪ **Output level control [output level]**
⑫ **Noise reduction select switch**
**[Noise Reduction (Dolby NR • out • dbx tape ➡ dbx disc)]**
⑬ **Record muting button (rec mute (O))**
⑭ **Fast forward button [ff (M • S) (▶▶)]**
⑮ **Counter reset button [counter reset]**
⑯ **Pause button and indicator [pause (II)]**
⑰ **Play button and indicator [play ( ▶ )]**
⑱ **Stop button [stop ( ■ )]**
⑲ **Rewind button [rew (M • S) (◀◀)]**
⑳ **Record button and indicator [rec (○)]**
㉑ **Headphones jack [phones]**
㉒ **Timer start switch [ timer (rec • off • play)]**
㉓ **Line output jacks [LINE OUT (R • L)]**
㉔ **Line input jacks [LINE IN (R • L)]**
㉕ **Voltage selector [VOLTAGE SELECTOR]**

# OPERATING INSTRUCTION

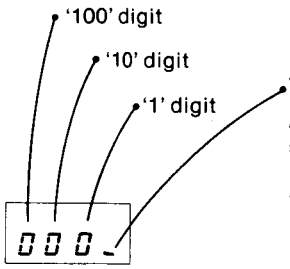
## Digital multi counter

The Digital multi counter can be used in combination with the memory repeat, music select, record muting and pause functions.

### (1) Using it as a tape counter

The 3-digit digital counter featured in this unit displays a count which is virtually identical to that of Technics' mechanical counter. With a C-60 tape, the count reaches about 400, with a C-90 tape about 600 and with a C-120 tape about 800. The tape counter is employed to read out the tape position by means of the counter figures and so program search can be performed easily.

**Tape counter readout**




Tape running display

A short rod which rotates in the same direction as the revolving reels is used to indicate that the tape is running. When the rod has gone through one rotation, the count is increased by 1.

**Setting to "000"**

- When the Power switch is pushed and the power switched on, the counter is reset to "000".
- When other displays appear on the Digital multi counter, set to "000" in the sequence given in the table below.

| Present display | "000" setting procedure |
|---|---|
| Tape counter<br>123 | Depress the Counter reset button |
| Remaining time counter<br>00:00 12:34 | 1. Depress the Tape/time select button.<br>2. Depress the Counter reset button. |
| Skipping programs<br>oo o3 | 1. Depress the Music select button.<br>2. When the time display appears, depress the Tape/time select button and switch over to the tape counter display.<br>3. Depress the Counter reset button |

### (2) Displaying the remaining tape time

The remaining time on the tape is displayed by setting the time at the beginning of the tape in accordance with the length of the tape, and while the tape is running in the recording mode, the time is counted down.

A 30-minute recording can be made on one side with a C-60 tape. When the remaining time counter is set to "30:00" at the beginning of the tape and recording commenced, the counter will show how many minutes of recording are left on the side of the tape being recorded.

Operate as follows:

1. Prepare to operate
   - Depress the Stop button and stop the tape at its beginning.
   - Set the Memory repeat button to the "off" position.
2. When the counter is functioning as a tape counter or is displaying a different indication, change over to the remaining time counter display in the sequence given in the table below.

| Present display | Procedure for selection |
|---|---|
| Tape counter<br>000 123 | Depress the Tape/time select button. |
| Skipping programs<br>oo o3 | 1. Depress the Music select button.<br>2. When the tape counter display appears, depress the Tape/time select button. |

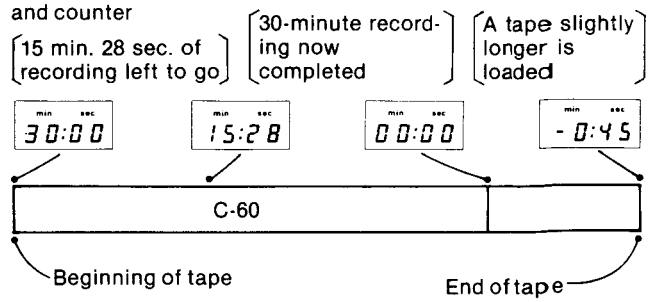
3. Set the time in accordance with the tape length. Every time the Set button is depressed, the counter goes through the following indications: "15:00", "23:00", "30:00", "45:00" and "60:00". Set the time in accordance with the tape length, referring to the table below.

| Tape length | Set time | One-side recording time (min.) |
|---|---|---|
| C — 30 | 15:00 | 15 |
| C — 46 | 23:00 | 23 |
| C — 60 | 30:00 | 30 |
| C — 90 | 45:00 | 45 |
| C — 120 | 60:00 | 60 |

* Some tapes with a non-standard length are sold. When using one of these, set the time to the closest value in the above table.

4. Start the recording

The tape runs and as the amount of tape remaining decreases, the time indicated on the counter also decreases. The figure below shows the relationship between the tape and counter




**Notes:**

- Do not depress the Fast forward or Rewind button while the remaining tape time is being displayed. This action will cause the counter to function as a tape counter and make it unable to display the correct remaining tape time.
- If the Tape/time select button is depressed when changing over to the remaining time counter, "12:34" or "-0 : 02" will be displayed. This is not the remaining tape time display.
  To find out the precise remaining tape time, it is necessary for the time to be set at the beginning of the tape.

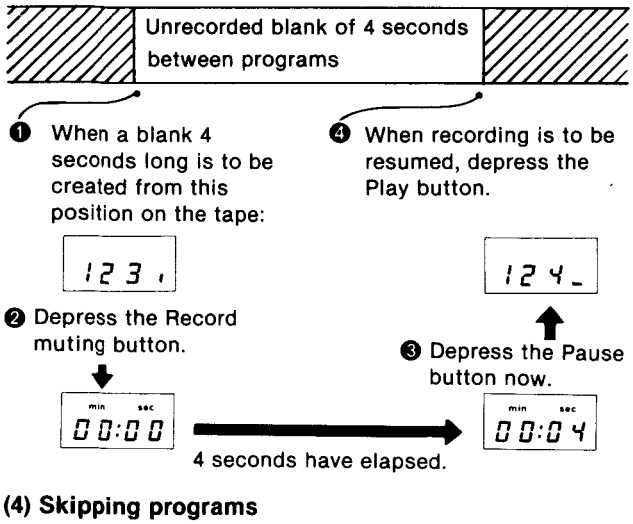
### (3) Displaying the record muting time

When the Record muting button is depressed during recording, the Digital multi counter starts counting each passing second and no sound is recorded on the tape.

The function can be used to created unrecorded blanks on

the tape of the required length. Blanks of about 4 seconds are required for the music selector to work accurately.

• Given below is the procedure for creating unrecorded blanks of 4 seconds.




### (4) Skipping programs

It is possible to skip up to 20 programs.

Operate as follows:

1. Prepare to operate.
   - Set the Memory repeat button to the "off" position.
   - Depress the Music select button and make the Digital multi counter indicate "00".
2. Set the number of programs to be skipped.
   - Every time the Set button is depressed, the number increases by 1. Set to the desired number.
   - To reset the number of programs to be skipped (for instance, "03" has been set although "02" was initially desired), depress the Music select button twice to make the counter display "00", and then depress the Set button to set the desired number.
3. Depress the Fast forward or Rewind button.
   - Playback starts automatically as soon as the tape reaches the start of the required program.
   - The digital multi counter display decreases by 1 every time a gap between programs is detected, and when playback begins, it changes over to the tape counter function.

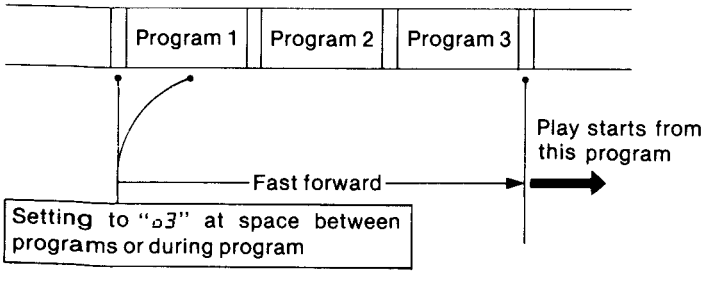
**Notes:**

- The number of programs to be skipped can be set in either the stop or playback mode.
  When the Pause or Stop button is depressed immediately after the setting has been made in the playback mode, the setting is released.
  When the Pause or Play button is depressed immediately after the setting has been made in the stop mode, the setting may be released.
- When the Stop or Play button is depressed when searching for a program, the skipping program search mode is released.

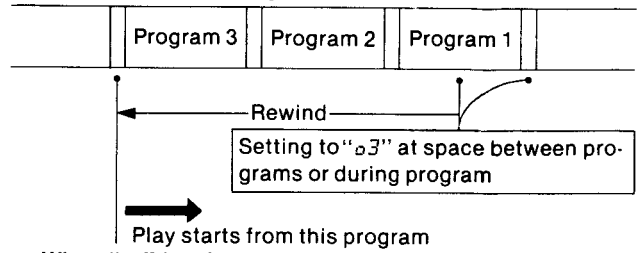
### Counting the number of programs to be skipped

**■ When "03" has been set**

• When searching for programs in the fast forward mode




• When searching for programs in the rewind mode



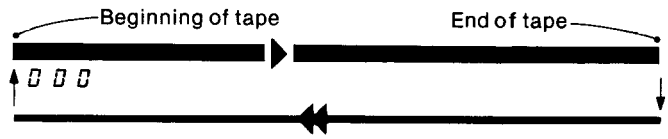

**■ When "00" has been set**

- When the tape is fast forwarded, playback will begin from the program following that now heard.
- When the tape is rewound, playback will begin from the start of the program now heard.

### (5) Memory repeat playback

**When playing back the whole tape repeatedly**

1. Set the tape counter to "000" at the position corresponding to the beginning of the tape.
2. Set the Memory repeat button to the "on" position.
3. Depress the Play button and make the tape run.
   When the tape comes to the end, it is rewound automatically and playback begins again automatically from the beginning. This operation is continued 16 times unless the Stop button is depressed.

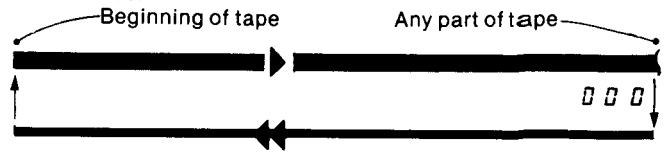



**Note:**

- Since "000" is detected at the end of the tape, the number of repeats may be reduced to a minimum of 8, depending on the state of the tape.

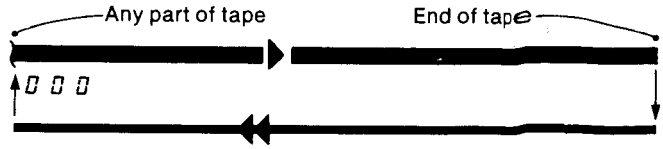
**Repeat playback from tape beginning to program somewhere on tape**

1. Set the tape counter to "000" at the position where the program whose play is to be repeated ends.
2. Rewind the tape to the beginning.
3. Set the Memory repeat button to the "on" position.
4. Depress the Play button and make the tape run. The tape is rewound automatically to the "000" display and the same playback operation as above is repeated automatically for 16 times.




**Repeat playback from a program somewhere on tape to tape end**

1. Set the tape counter to "000" at the position where the start of the program is located.
2. Set the Memory repeat button to the "on" position.
3. Depress the Play button and make the tape run. The tape is automatically rewound at the end of the tape and the part of the tape from the "000" display to the end is played back repeatedly 16 times automatically.




**Note:**

- Always set the Memory repeat button to the "off" position after use.

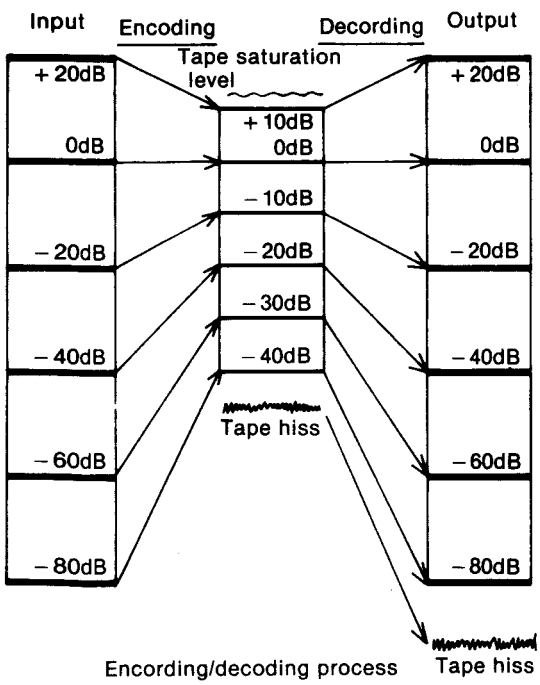
## dbx noise reduction system

### Features

1. Reduced noise over the whole audible frequency range (more than about "30dB" reduction).
2. The signal is compressed at a high recording level for recording to enable recording with minimal distortion and a wide dynamic range.
3. The linear logarithmic compression and expansion do not make the sound quality undergo change with level mismatching.

### Principle of basic operation

The dbx system works to expand the dynamic range by compressing (encoding) the signals and then expanding (decoding) them. As shown in the figure, the input signal level is halved during recording onto the tape. During playback the halved level is doubled to restore the original signal. The figure shows that high signals are greatly expanded (from "+10 dB" to "+20 dB") while low signals are given a low expansion ("−40dB" to "−80dB"). This results in a great improvement in the dynamic range and simultaneously in a great reduction in tape hiss.




### "disc" position for "dbx encoded discs"

This unit comes with a "[dbx] disc" position on the Noise reduction select switch for playing "dbx encoded discs."

**Playing "dbx encoded discs"**

Operate in the following sequence:

1. Set the input selector on the stereo amplifier to the "tape" position and the record selector to the "phono" position. If the amplifier is capable of tape monitor selection, set the tape monitor switch to the "tape" position and the input selector to the "phono" position.
2. Set the unit to the stop mode and then set the Noise reduction select switch to the "[dbx] disc" position.
   Disconnect the microphone if one has been connected to the unit.
3. Start operating the turntable.
4. Adjust the unit's Input level controls so that the Fluorescent level meter illumination indicates around "0 dB".
5. Adjust the volume using the control on the stereo amplifier.

**Note:**

- Do not set the Noise reduction select switch to the "[dbx] disc" position during tape playback since the sound will then no longer be heard.

Some open-reel type dbx encoded tapes are now available from music stores. These tapes can be played back just like the records by setting the Noise reduction select switch to the "disc" position.

**Recording "dbx encoded discs" onto tape**

1. Set the Noise reduction select switch to the "[dbx] disc position."
2. Adjust the recording level, following the "Recording level setting" instructions.
3. Start the recording.
   The sound of the disc is recorded on the tape still in encoded (compressed) form. The decoded (expanded) sound can, however, be monitored (through both the speakers connected to the amplifier and headphones connected to the unit). When playing back a tape which has been recorded in this way, set the Noise reduction select switch to the "[dbx] tape" position.

* Unlike ordinary records, "dbx encoded discs" have their sound dbx encoded (compressed) when it is cut into the sound grooves. This means that for replay, the sound must be returned to its original form through a decoder (expander). As a result, the noise level is reduced and the dynamic range is increased for a higher record play quality.

### Recording with Dolby NR

This unit includes the Dolby NR system, which reduces tape noise to a remarkable degree.
Briefly, the system works as follows: At low sound levels (where tape noise is most noticeable), the high-frequency portion of the sound is recorded at a higher level. Tape noise is not amplified.
During playback, the level of only that portion of the signal which was increased at the time of the recording, as well as tape noise, is reduced by a like amount. This causes the signal to be heard at a normal level, and the tape noise to be reduced significantly.

### Noise reduction select switch

- [dbx] tape: Used for dbx recording and for replaying dbx recorded tapes.
- [dbx] disc: Used for playing dbx encoded discs on a turntable and for recording such discs.
- Dolby NR: Used for recording with the Dolby NR system and replaying tapes which have been recorded with the Dolby NR system.
- Out: Used when noise reduction is not required.

# DISASSEMBLY INSTRUCTIONS


Fig. 1

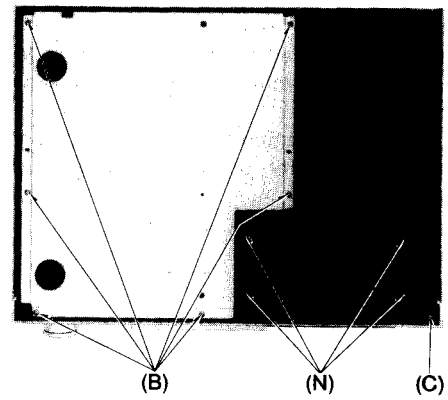



Fig. 2

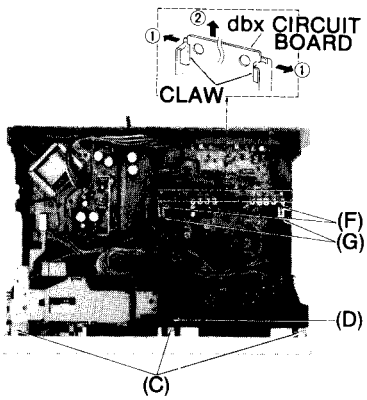



Fig. 3

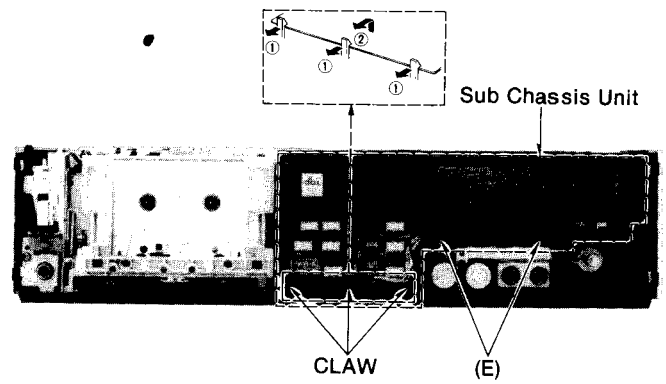



Fig. 4

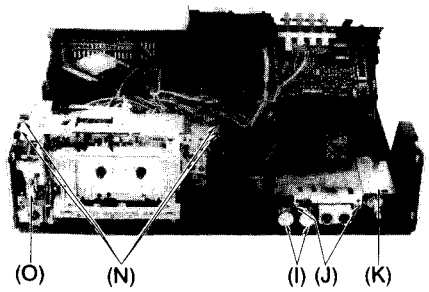



Fig. 5

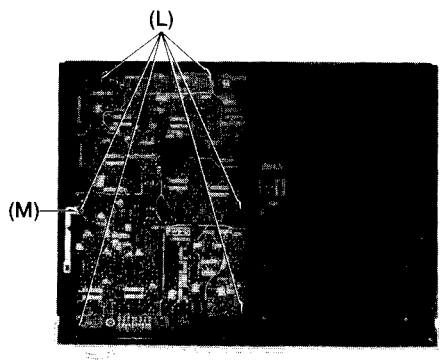



Fig. 6

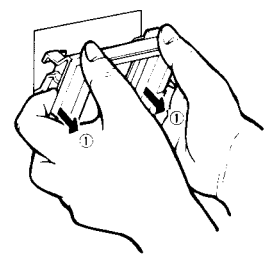



Fig. 7

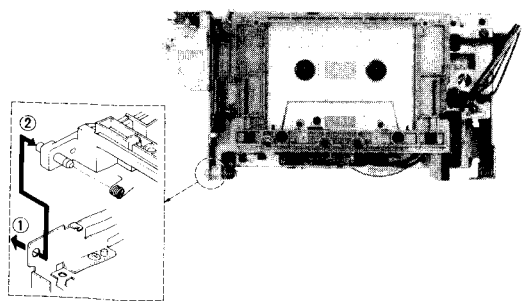



Fig. 8

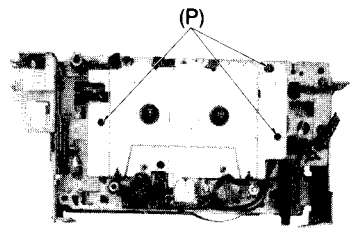



Fig. 9

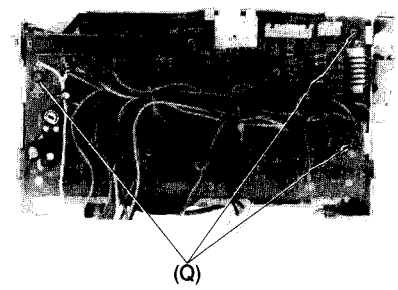


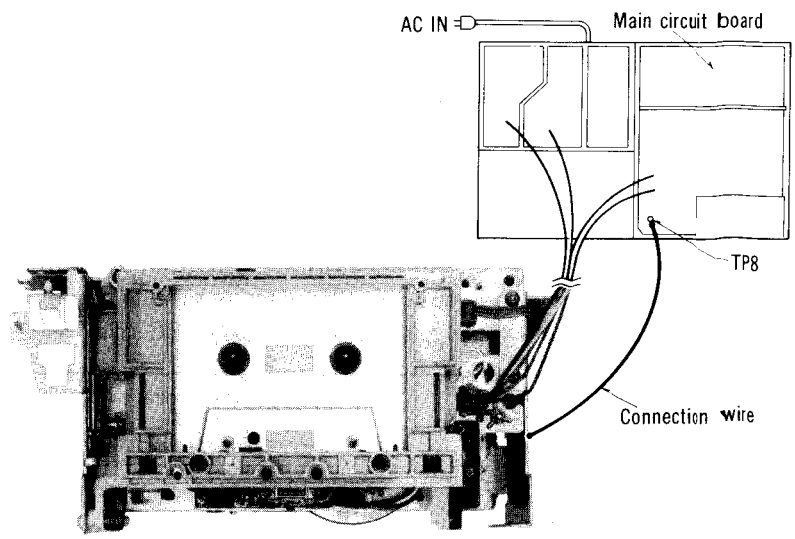

Fig. 10

| Ref. No. | Procedure | To remove ——. | Remove ——. | Shown in fig. ——. |
|---|---|---|---|---|
| 1 | 1 | Case cover | • 4 screws ····· (A) | 1 |
| 2 | 2 | Bottom cover | • 6 screws ····· (B) | 2 |
| 3 | 1→2→3 | Front panel | • 4 screws ····· (C) | 2, 3 |
| 4 | 1→2→3→4 | Sub chassis unit | • 1 screw ····· (D) | 3 |
| 5 | 1→2→3→4→5 | Push switch circuit board | • 2 screws ····· (E) | 4 |
| 6 | 1→2→3→4→6 | Key board circuit board | • As shown in fig. 4, pull the claw in the direction of arrow ①, the pull key board circuit board in the direction of arrow ②. Then, it can be removed. | 4 |
| 7 | 1→7 | dbx circuit board | • 2 red screws ····· (F)<br>• dbx P.B. holder ····· (G)<br>• As shown in fig. 3, pull the claw in the direction of arrow ①, then pull dbx circuit board in the direction of arrow ②. Then, it can be removed. | 3<br>3<br>3 |
| 8 | 1→2→3→4→7→8 | Main circuit board | • 2 volume knobs ····· (H)<br>• 2 select knobs ····· (I)<br>• 2 screws ····· (J)<br>• Meter shield plate ····· (K)<br>• 6 red screws ····· (L)<br>• Earth plate-A ····· (M) | 1<br>5<br>5<br>5<br>6<br>6 |
| 9 | 1→2→3→4→9 | Mechanism unit | • 8 screws ····· (N)<br>• Power button ····· (O) | 2, 5<br>5 |
| 10 | 10 | Cassette lid | • As shown in fig. 7, pull in the direction of arrow ①. Then, it can be removed. | 7 |
| 11 | 1→2→3→4→9→10→11 | Cassette holder | • While pushing mechanical chassis in the direction of arrow ①, extract cassette holder in the direction of arrow ②. | 8 |
| 12 | 1→2→3→4→9→10→11→12 | Mechanism cover | • 3 screws ····· (P) | 9 |
| 13 | 1→2→3→4→9→13 | Main control circuit board | • 3 screws ····· (Q) | 10 |

## • MECHANISM SECTION

1. For repair, measurement or adjustment with the mechanism removed from the unit be sure to ground the lower base plate of the mechanism.
2. For grounding, connect a extension cord to the mechanism's lower base plate and TP8 (earth) from main circuit board.
3. Without grounding, the auto tape selector does not operate properly.

**(TOP VIEW)**



# TECHNICHAL EXPLANATION

## • DISPLAY SECTION

### 1. DISPLAY TUBE

Internal display-tube connections are shown below.

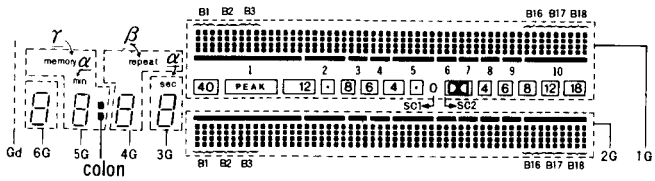



Fig. A

Each segment has a triode configuration (See fig. B).

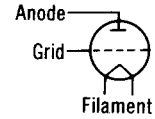



Fig. B

NOTES:

Anode: 1—10, (a)—(g), B1—B18, $\alpha$—$\gamma$, colon
Grid: 1G—6G, Gd

### 2. DIGITAL COUNTER

1. During tape counter indication, tape count is displayed by the first three digits (6G, 5G, 4G). The bottom digit (fig. C) is used to indicate tape travel and direction as one of the segments (c), (d), (e) and (g) lights (counterclockwise ration for PLAY and FF; clockwise for REW).
2. For tape remaining time indication, all four digits and " : ", "min" and "sec" are used. For recording muting time indication, display elements are the same.
3. Only lower two digits are used to indicate music selection (for jumping up to 20 selections). These functions of the digital counter are controlled by outputs from the microprocessor IC501 via FL driver IC302 and IC303.

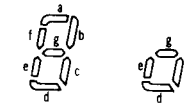


Fig. C

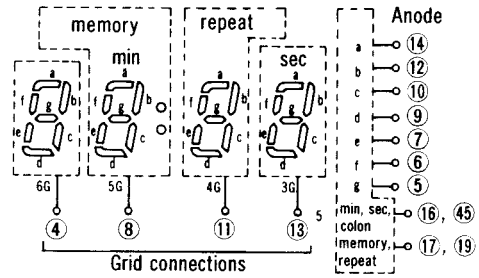



Fig. D

### 3. LEVEL METER

This model uses a level meter IC AN6870N for dynamic lighting indication, featuring a wide range of −40dB to +18dB range.

**BLOCK DIAGRAM**

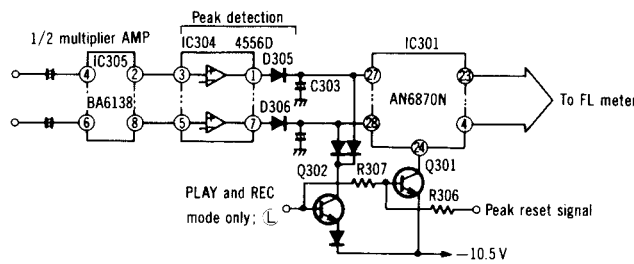



Fig. E

### CIRCUIT OPERATION

Most conventional level meters using AN6870 (IC301) can only display levels in the range of −20dB to +8dB. RS-M255X using the same AN6870, however, is capable of covering a range of −40dB to +18dB, which is sufficient for the expanded dynamic range of dbx.

A conventional peak meter circuit follows the IC304, which means a limited display range between −20dB and +8dB. To offset this, a 1/2 multiplier circuit is added to the pre-stage to double the display range.

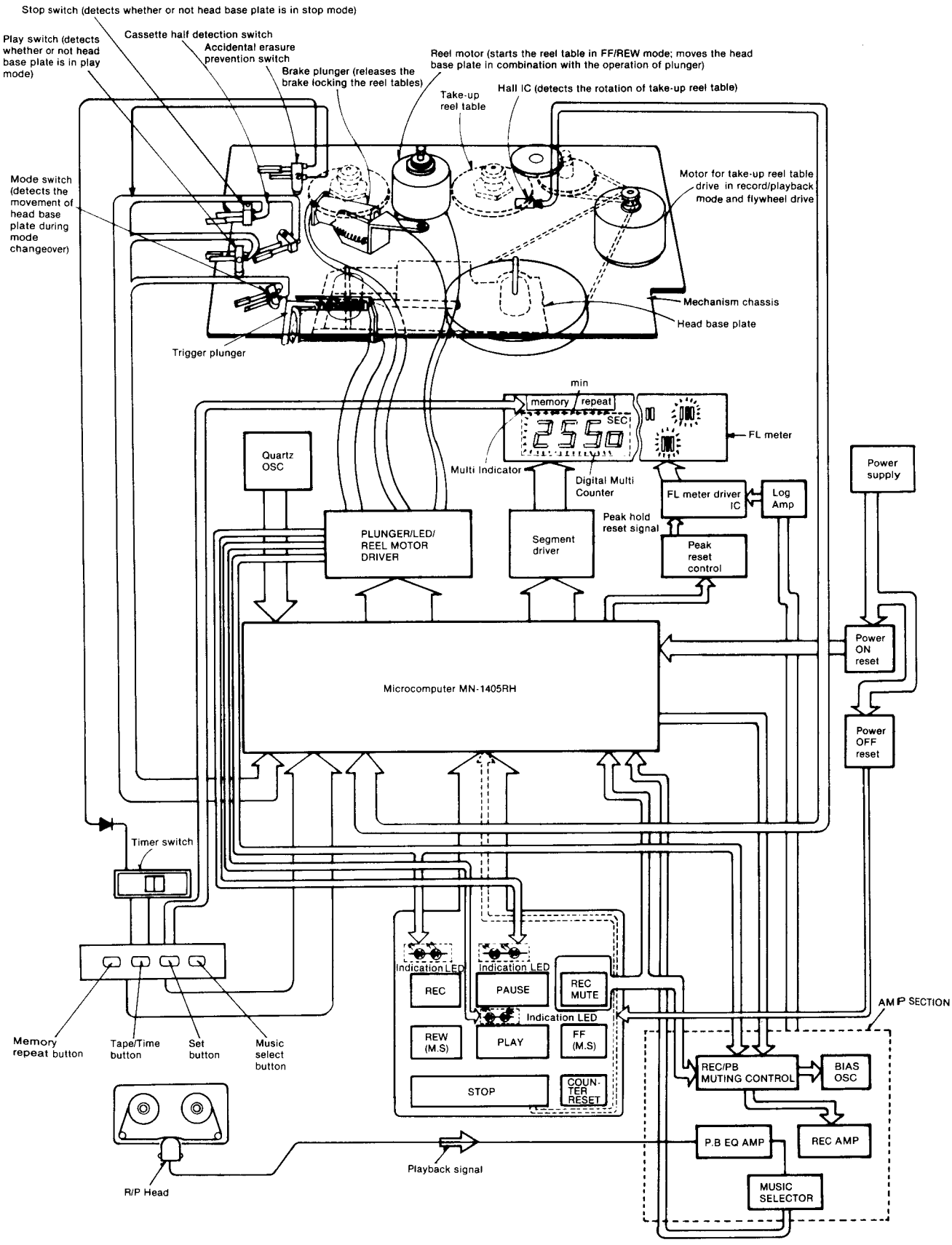
In other words, the dynamic range (58dB) of the input signal to IC305 (BA6138) is compressed to approximately half (multiplied by 1/2) to obtain a 28dB dynamic range for the signal to the meter circuit.

Sound signal (AC signal) is inputted to this IC, which outputs a DC signal converted to half of the input.

| Level meter indication | Changes in terminal voltages of IC305 | | LINE OUT voltage |
|---|---|---|---|
| | Pin ④ or ⑥ | Pin ② or ⑧ | |
| +12dB | +12dB | around +6dB | +12dB (1600mV) |
| 0dB | 0dB | 0dB | 0dB (400mV) |
| −12dB | −12dB | around −6dB | −12dB (100mV) |

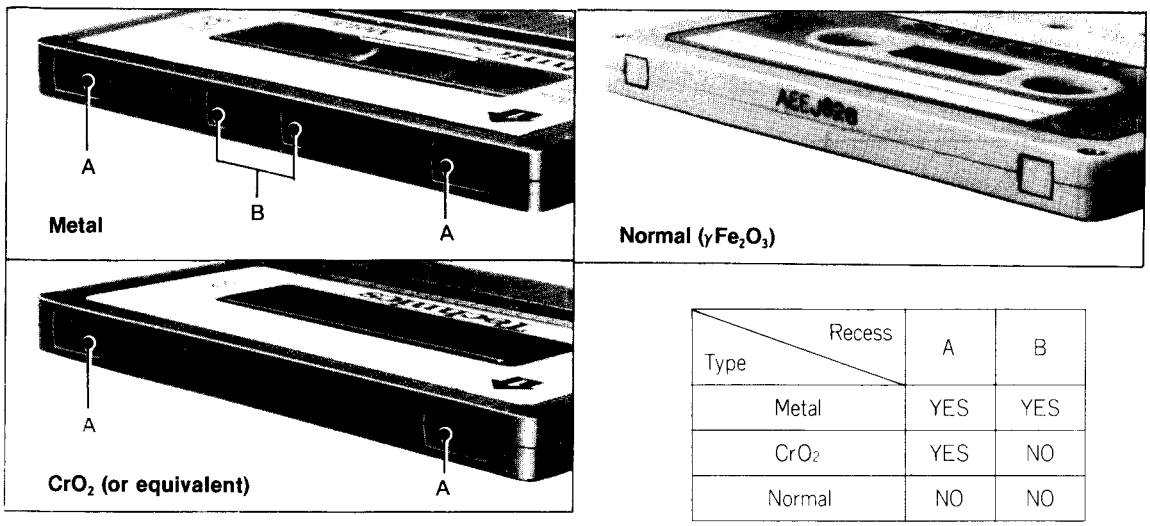
## • CONTROL SECTION

RS-M255X contains a microcomputer MN1405RH for various input control buttons, rotation detection, and operation commands. The microcomputer quickly processes signals received from the 19 control switches and a hall IC.



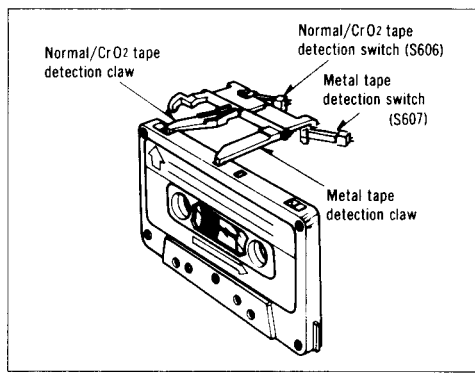
## • AUTO TAPE SELECTOR

This unit is equipped with an auto-tape selector system that detects these identification recesses and automatically selects the correct bias and equalization for Normal, $CrO_2$ and Metal tape varieties.
Thus, the novice user can obtain the correct tape selector setting automatically to ensure proper recording and playback results.



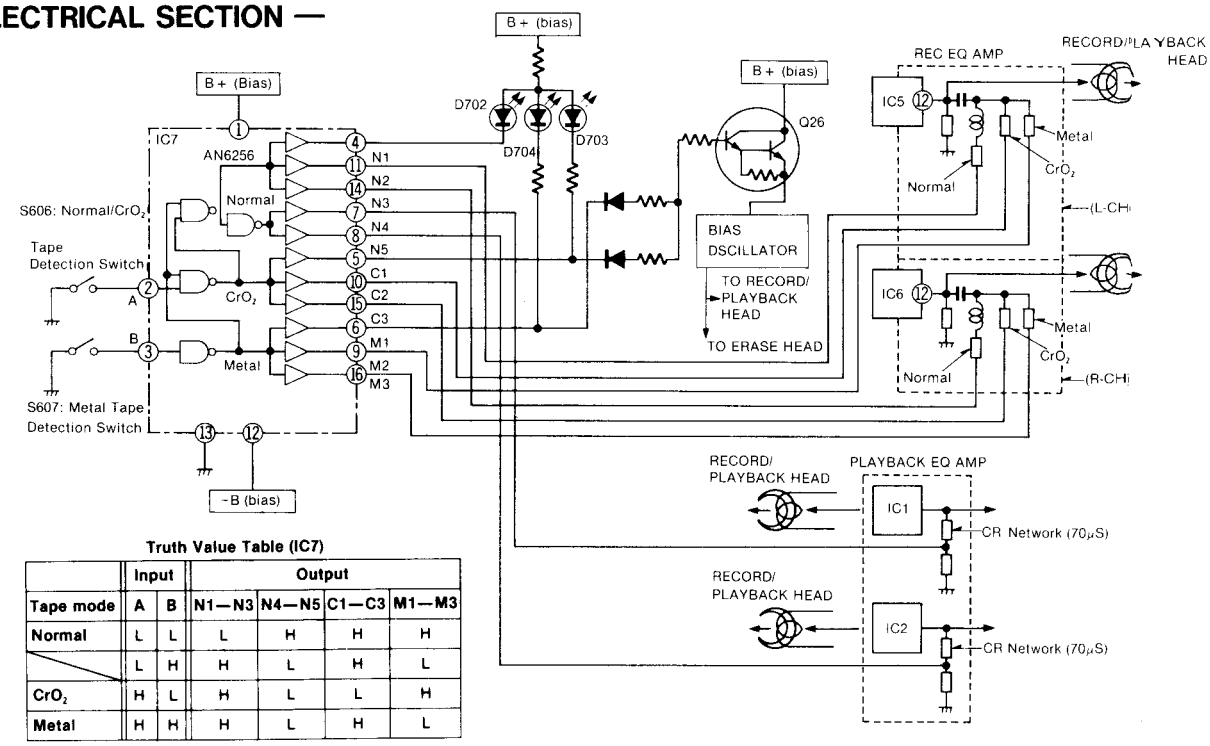

| Type \ Recess | A | B |
|---|---|---|
| Metal | YES | YES |
| $CrO_2$ | YES | NO |
| Normal | NO | NO |

## — MECHANICAL SECTION —




| S607 | S606 | Mode |
|---|---|---|
| | | Normal tape mode |
| | | $CrO_2$ tape mode |
| | | Metal tape mode |

## — ELECTRICAL SECTION —




**Truth Value Table (IC7)**

| | Input | | Output | | | |
|---|---|---|---|---|---|---|
| Tape mode | A | B | N1—N3 | N4—N5 | C1—C3 | M1—M3 |
| Normal | L | L | L | H | H | H |
| | L | H | H | L | H | L |
| $CrO_2$ | H | L | H | L | L | H |
| Metal | H | H | H | L | H | L |

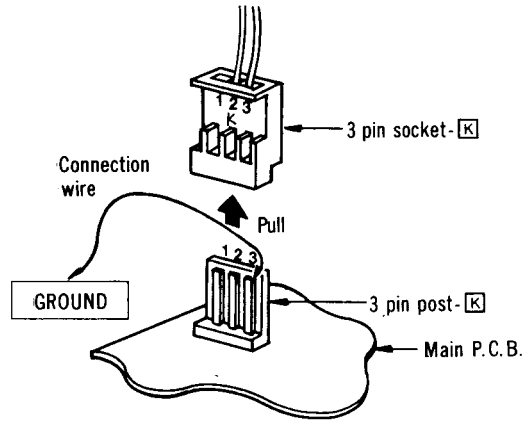
# MEASUREMENT & ADJUSTMENT METHODS

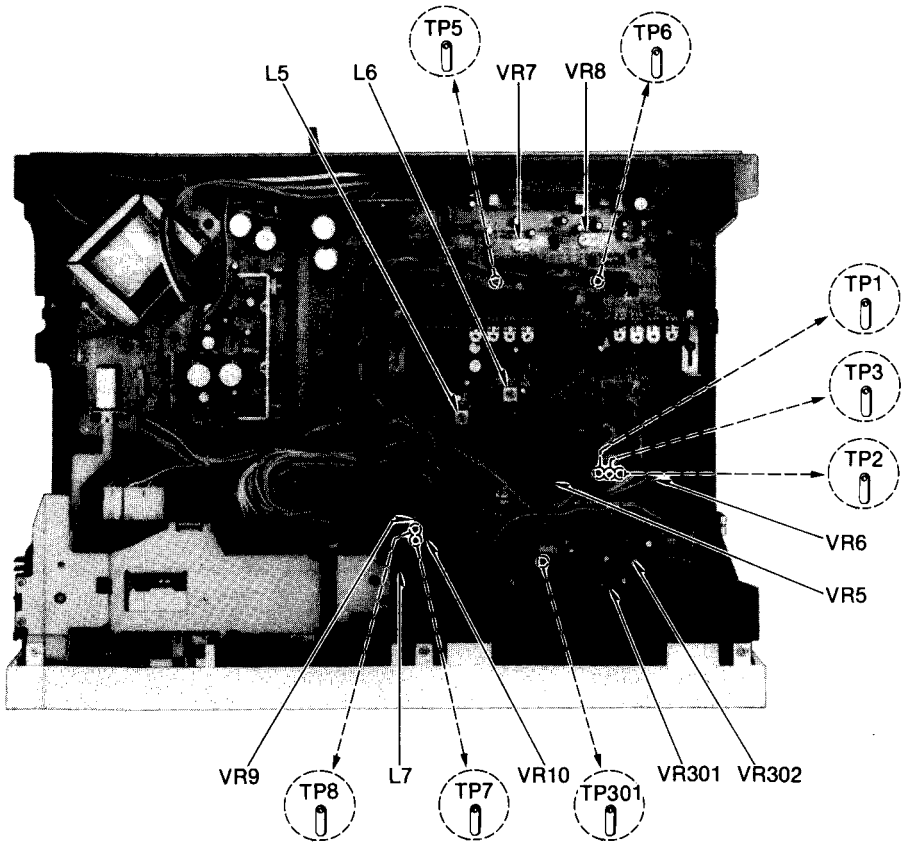
## Tape selector (Tape mode switching)

For measurement adjustment with test tapes without tape detection holes (A and B), switch tape modes as follows.
(For normal tape mode, just insert a normal tape into the cassette holder.)

* **Metal tape mode setting:**
  Metal tape mode is obtained by disconnecting the 3 pin socket [K] from the 3 pin post [K] on the P.C.B. (Printed Circuit Board).

* **$CrO_2$ tape mode setting:**
  First, disconnect the 3 pin socket [K] in the same way as above. Then, as illustrated in the figure right, connect the terminal-3 of the 3 pin post to the ground with a connection wire.



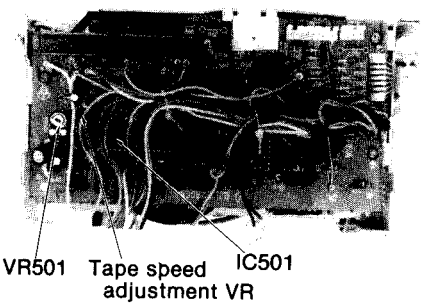




Fig. 1

**NOTES:** Keep good condition, set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.
- Judgeable room temperature: 20±5°C (68±9°F)
- NR switch: OUT
- Timer start switch: OFF
- Input level controls: Maximum
- Output level control: Maximum

| ITEM | MEASUREMENT & ADJUSTMENT |
|---|---|
| Ⓐ Head azimuth adjustment<br>Condition:<br>* Playback mode | L-CH/R-CH output balance adjustment<br>1. Make connections as shown in fig. 2. |

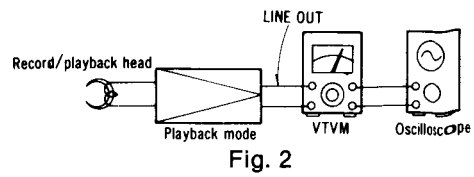
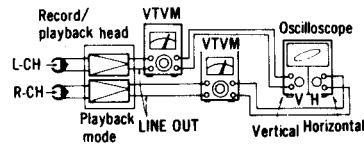
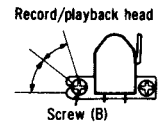
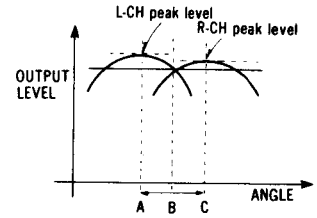
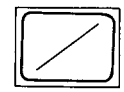
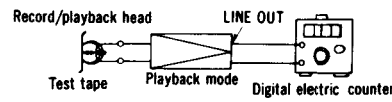
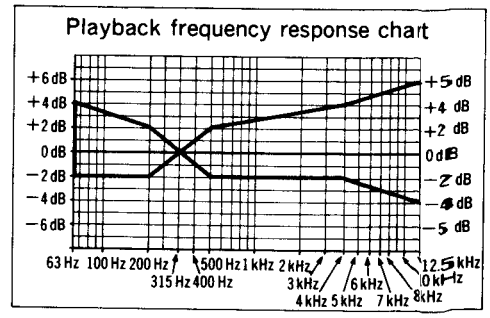
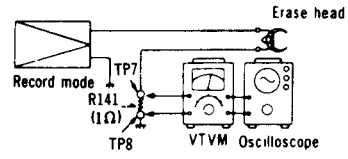
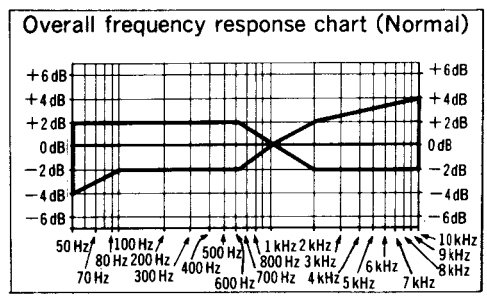
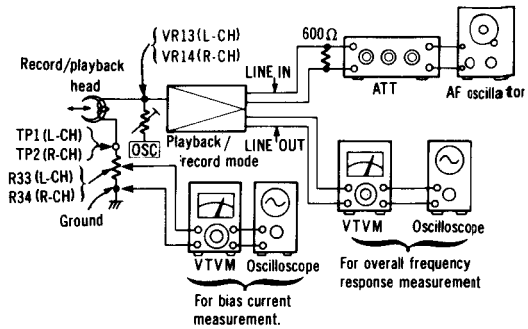



Fig. 2

| ITEM | MEASUREMENT & ADJUSTMENT |
|---|---|
| Equipment:<br>* VTVM * Oscilloscope<br>* Test tape (azimuth)<br>··· QZZCFM | 2. Playback the 8kHz signal from the test tape (QZZCFM).<br>Adjust screw (B) in fig. 3 for maximum output L-CH and R-CH levels.<br>When the output levels of L-CH and R-CH are not at maximum at the same time, readjust as follows.<br>3. Turn the screw shown in fig. 3 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate the angle B between angles A and C, i.e., a point where L-CH and R-CH output levels come together at maximum. (Refer to figs. 3 and 4.)<br><br>**L-CH/R-CH phase adjustment**<br>4. Make connections as shown in fig. 5.<br>5. Playback the 8kHz signal from the test tape (QZZCFM). Adjust screw (B) shown in fig. 3 so that pointers of the two VTVMs swing to maximum and a waveform as illustrated in fig. 6 is obtained on the oscilloscope.<br><br>  <br><br>Fig. 5<br><br>  <br><br>Fig. 3<br><br>  <br><br>Fig. 4<br><br>  <br>Fig. 6 |
| **Ⓑ Tape speed**<br>Condition:<br>* Playback mode<br>* Normal tape mode<br>Equipment:<br>* Digital electronic counter<br>* Test tape ··· QZZCWAT | **Tape speed accuracy**<br>1. Test equipment connection is shown in fig. 7.<br>2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to frequency counter.<br>3. Measure this frequency.<br>4. On the basis of 3,000Hz, determine value by following formula:<br>$\text{Tape speed accuracy} = \frac{f - 3{,}000}{3{,}000} \times 100\ (\%)$<br>where, f = measured value<br>5. Take measurement at middle section of tape.<br><br>**Standard value: ±1.5%**<br><br>**Adjustment method**<br>1. Playback the test tape (middle).<br>2. Adjust so that frequency becomes 3,000Hz.<br>3. Tape speed adjustment VR shown in fig. 1.<br><br>**Tape speed fluctuation**<br>Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:<br>$\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3{,}000} \times 1000\ (\%)$<br>$f_1$ = maximum value, $f_2$ = minimum value<br><br>**Standard value: Less than 1.0%** |  <br><br>Fig. 7 |
| **Ⓒ Playback frequency response**<br>Condition:<br>* Playback mode<br>* Normal tape mode<br>Equipment:<br>* VTVM * Oscilloscope<br>* Test tape ··· QZZCFM | 1. Test equipment connection is shown in fig. 2.<br>2. Place UNIT into playback mode.<br>3. Playback the frequency response test tape (QZZCFM).<br>4. Measure output level at 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at LINE OUT.<br>5. Make measurement for both channels.<br>6. Make sure that the measured value is within the range specified in the frequency response chart. (Shown in fig. 8.) |  <br><br>Fig. 8 |

| ITEM | MEASUREMENT & ADJUSTMENT |
|---|---|
| **Ⓓ Playback gain**<br>Condition:<br>• Playback mode<br>• Normal tape mode<br>Equipment:<br>• VTVM • Oscilloscope<br>• Test tape ··· QZZCFM | 1. Test equipment connection is shown in fig. 2.<br>2. Playback standard recording level portion on test tape (QZZCFM 315Hz, 0dB), and using VTVM measure the output level at LINE OUT jack.<br>3. Make measurement for both channels.<br>**Standard value: 0.7V±1dB**<br>**(around 0.42V: at test points TP5 (L-CH) and TP6 (R-CH))**<br>**Adjustment**<br>1. If measured value is not within standard, adjust VR5 (L-CH), VR6 (R-CH) (shown in fig. 1).<br>2. After adjustment, check "Playback frequency response" again. |
| **Ⓔ Erase current**<br>Condition:<br>• Record mode<br>• Metal tape mode<br>Equipment:<br>• VTVM • Oscilloscope | 1. Test equipment connection is shown in fig. 9.<br>2. Place UNIT into metal tape mode.<br>3. Press the record and pause buttons.<br>4. Read voltage on VTVM and calculate erase current by following formula:<br>$\text{Erase current (A)} = \frac{\text{Voltage across both ends of R141}}{1\ (\Omega)}$<br>**Standard value: 155±15mA (Metal position)**<br>  <br>Fig. 9<br>5. If measured value is not within standard, adjust as follows.<br>**Adjustment**<br>1. Open the point (B) and short the point (A) on the main circuit board in the circuit board diagram (See page 41).<br>2. Make measurement for erase current.<br>3. Make sure that the measured value is within the erase current of 140mA to 170mA.<br>4. If it is beyond the value, carry out the following adjustments:<br>• If the erase current is less than 140mA, open the point (A).<br>• If the erase current is more than 170mA, short the points (A) and (B). |
| **Ⓕ Overall frequency response**<br>Condition:<br>• Record/playback mode<br>• Normal tape mode<br>• $CrO_2$ tape mode<br>• Metal tape mode<br>• Input level controls ··· MAX<br>• Output level control ··· MAX<br>Equipment:<br>• VTVM • AF oscillator<br>• ATT • Oscilloscope<br>• Resistor (600Ω)<br>• Test tape<br>(reference blank tape)<br>···QZZCRA for Normal<br>···QZZCRX for $CrO_2$<br>···QZZCRZ for Metal | **Note:**<br>Before measuring and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).<br>**Overall frequency response adjustment by recording bias current**<br>(Recording equalizer is fixed)<br>1. Make connections as shown in fig. 11.<br>2. Place UNIT into normal tape mode and load the test tape (QZZCRA).<br>3. Input a 1kHz, −24dB signal through LINE IN.<br>Place the set in record mode.<br>4. Fine adjust the attenuator to obtain 0.7V LINE OUT output.<br>• Make sure that the input signal level is −24±4dB with 0.7V output voltage.<br>5. Adjust the attenuator to reduce the input signal level by 20dB.<br>6. Adjust the AF oscillator to generate 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz and 10kHz signals, and record these signals on the test tape.<br>7. Playback the signals recorded in step 6, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 10).<br>(If the curve is within the charted specifications, proceed to steps 8, 9, 10 and 11.)<br>If the curve is not within the charted specifications, adjust as follows;<br>  <br>Fig. 10<br>  <br>Fig. 11 |

| ITEM | MEASUREMENT & ADJUSTMENT |
|---|---|

**Adjustment Ⓐ:**

When the curve exceeds the overall frequency response chart specifications (fig. 10) as shown in fig. 12.

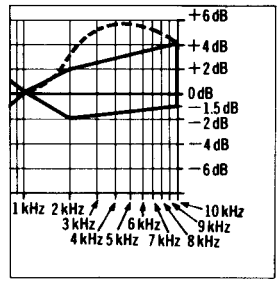



**Fig. 12**

1) Increase bias current by turning VR9 (L-CH) and VR10 (R-CH). (See fig. 1 on page 11.)
2) Repeat steps 6 and 7 to confirm. (Proceed to steps 8, 9, 10 and 11 if the curve is now within the charted specifications is fig. 10.)
3) If the curve still exceeds the specifications (fig. 10), increase bias current further and repeat steps 6 and 7.

**Adjustment Ⓑ:**

When the curve falls below the overall frequency response chart specifications (fig. 10) as shown in fig. 13.

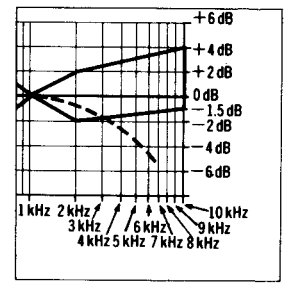



**Fig. 13**

1) Reduce bias current by turning VR9 (L-CH)) and VR10 (R-CH).
2) Repeat steps 6 and 7 to confirm. (Proceed to steps 8, 9, 10 and 11 if the curve is now within the charted specifications-in fig. 10.)
3) If the curve still falls below the charted specifications (fig. 10), reduce bias current further and repeat steps 6 and 7.

8. Place UNIT into $CrO_2$ tape mode.
9. Change test tape to QZZCRX, and record 50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 4 kHz, 8 kHz, 10 kHz and 12.5 kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for $CrO_2$ tapes (fig. 14).
10. Place UNIT into metal tape mode change test tape to QZZCRZ, and record 50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 4 kHz, 8 kHz, 10 kHz and 12.5 kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 14).

**Overall frequency response chart ($CrO_2$, Metal)**

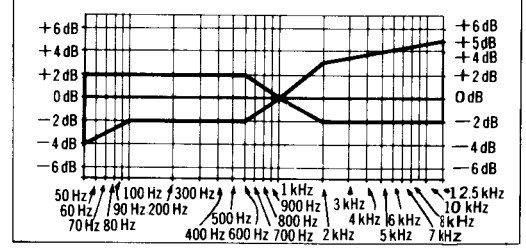



**Fig. 14**

11. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode.
    * Read voltage on VTVM and calculate bias current by following formula:

$$\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10\ (\Omega)}$$

**Standard value:**
**around 340 μA (Normal position)**
**around 440 μA ($CrO_2$ position)**
**around 710 μA (Metal position)**
} **: measured at TP1 (L-CH) and TP2 (R-CH)**

**Ⓖ Overall gain**

Condition:
* Record/playback mode
* Normal tape mode
* Input level controls ··· MAX
* Output level control ··· MAX
* Standard input level;
  MIC ····· −72 ± 3 dB
  LINE IN ··· −24 ± 3 dB

Equipment:
* VTVM
* AF oscillator
* ATT
* Oscilloscope
* Resistor (600 Ω)
* Test tape (reference blank tape) ··· QZZCRA for Normal

1. Test equipment connection is shown in fig. 15.
2. Place UNIT into normal tape mode, and load the test tape (QZZCRA).
3. Place UNIT into record mode.
4. Supply 1 kHz signal (−24 dB) from AF oscillaror, through ATT to LINE IN.
5. Adjust ATT until monitor level at LINE OUT becomes 0.7 V.
6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.7 V.
7. If measured value is not 0.7 V, adjust VR7 (L-CH), VR8 (R-CH).
8. Repeat from step (2).

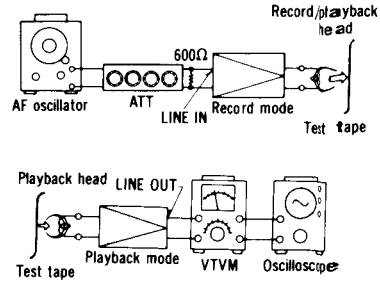
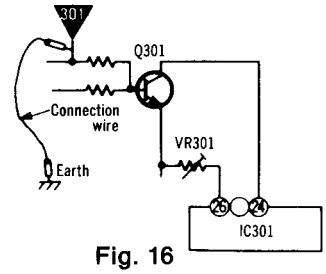
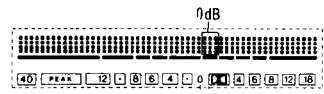
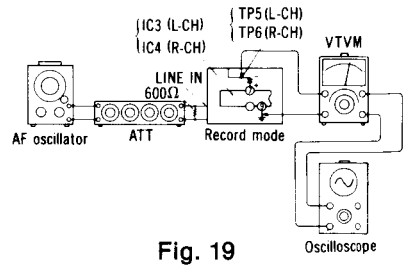
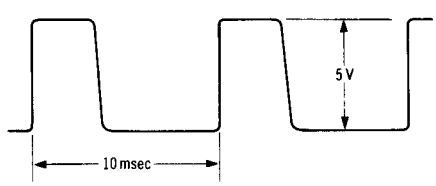
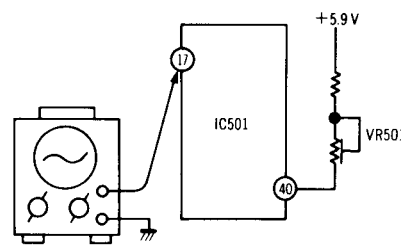
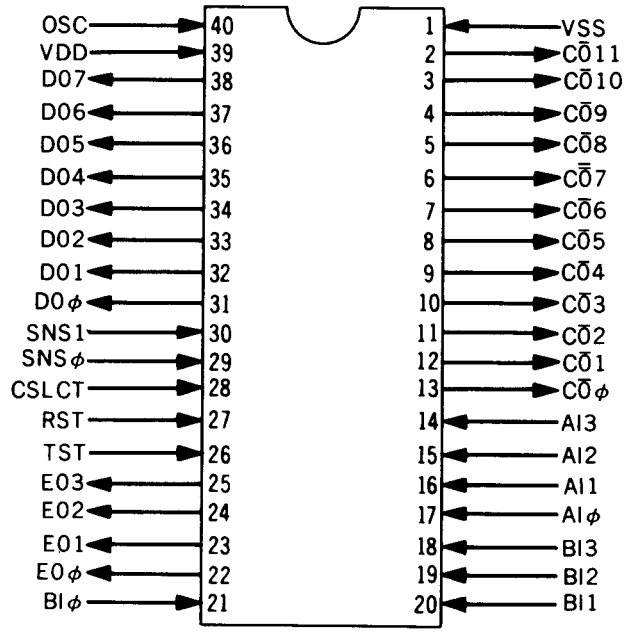


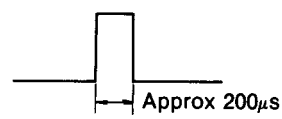
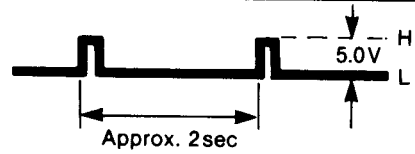
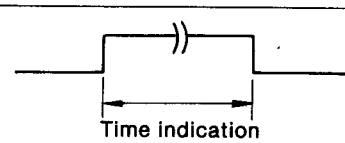

**Fig. 15**

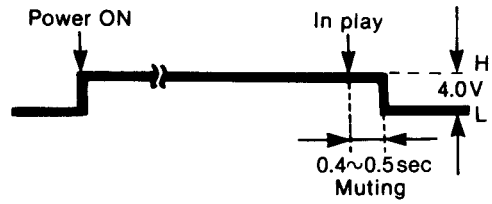
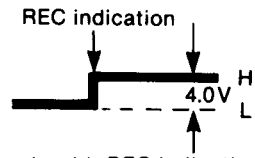
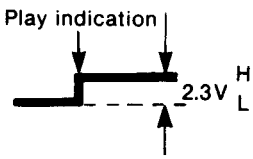
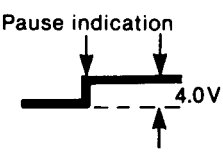
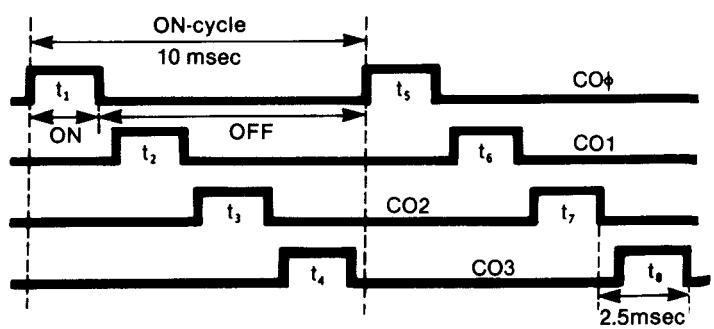
| ITEM | MEASUREMENT & ADJUSTMENT |
|---|---|
| **⓮ Fluorescent meter**<br>Condition:<br>* Record mode<br>* Input level controls ··· MAX<br>* Output level control ··· MAX<br>Equipment:<br>* VTVM * AF oscillator<br>* ATT | 1. Make connections as shown (See fig. 15).<br>2. Connect a wire between TP301 and ground terminal (See fig. 16).<br>3. In the recording pause mode, apply 1 kHz (−24 dB) to LINE IN.<br>4. Adjust ATT so that output level at LINE OUT is 0.7 V.<br><br>**−40 dB adjustment**<br>5. Adjust ATT so that the level adjusted at step 4 is reuced by 40 dB.<br>6. At this time, check that −40 dB indicator is lighted halfway (intermediate brightness between full brightness and light-out: See fig. 17).<br>7. If the indicator is not lighted halfway as described in step 6, adjust VR302.<br><br>**0 dB adjustment**<br>8. Restore the condition of step 4 (set LINE OUT output level to 0.7 V).<br>9. At this time, check that 0 dB indicator is lighted halfway (intermediate brightness between full brightness and light-out: See fig. 18).<br>10. If improper, adjust VR301.<br>11. Repeat adjustments and checks at steps 4, 5, 6, 7, 8, 9 and 10 two or three times.<br>12. Disconnect the wire between TP301 and ground terminal, which had been connected at step 2.<br><br>  <br>Fig. 16<br>  <br>Fig. 17<br>  <br>Fig. 18 |
| **⓯ Dolby NR circuit**<br>Condition:<br>* Record mode<br>* Dolby NR switch ··· IN/OUT<br>* Input level controls ··· MAX<br>Equipment:<br>* VTVM * AF oscillator<br>* ATT * Oscilloscope<br>* Resistor (600 Ω) | 1. Test equipment connection is shown in fig. 20.<br>2. Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain −34.5 dB at PIN ⑦ [IC3 (L-CH), IC4 (R-CH)] (frequency 5 kHz).<br>3. Confirm that the value at IN position is 8 (±2.5) dB greater than the value at OUT position of Dolby NR switch.<br><br>  <br>Fig. 19 |
| **⓰ Input scanning time adjustment**<br>Condition:<br>* Stop mode<br>Equipment:<br>* Oscilloscope | 1. Connect oscilloscope to ⑰ terminal of IC501.<br>2. Measure the time of input scanning signal with oscilloscope as shown in fig. 20.<br><br>**Standard value: About 10 msec**<br><br>3. If the measured value is markedly different from the signal shown below, make the necessary adjustment with VR501.<br><br>  <br>  <br>Fig. 20 |

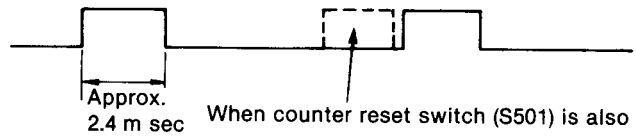
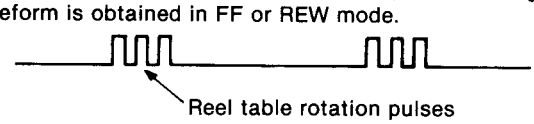
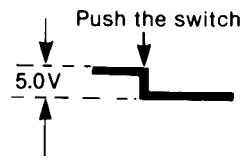
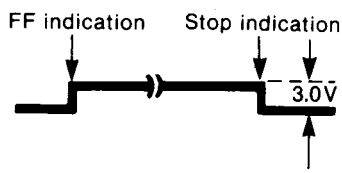
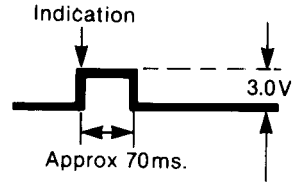
# MN1405RH (IC501) EACH TERMINAL FUNCTION AND WAVEFORM

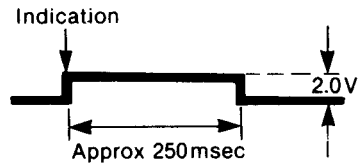
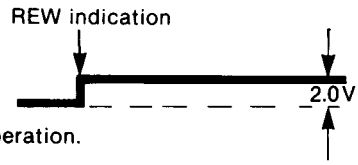
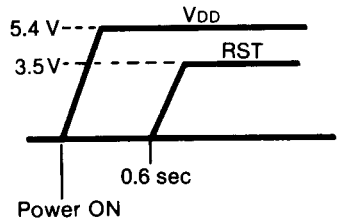
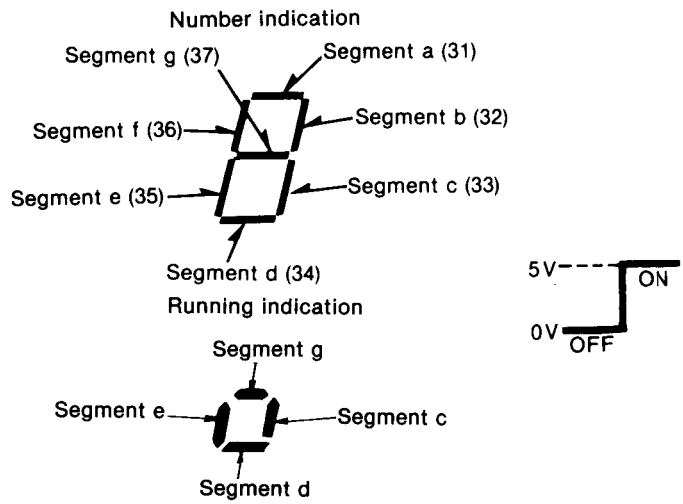
## (BOTTOM VIEW)

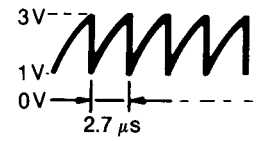



| Terminal No. | Symbol | Name | Function/operation |
|---|---|---|---|
| 1. | VSS | GND | |
| 2. | CŌ11 | TIMER REC•PLAY Signal output |   Becomes "H" level only when power is supplied. |
| 3. | CŌ10 | FL meter reset |   This output is for resetting the Peak Hold of the FL Meter. The pulse 2.5msec. width is transmitted in approx. 2-second cycles, regardless of the mechanism operation. |
| 4. | CŌ9 | TIME OUT | Not used.   Becomes "H" level only during time indication |
| 5. | CŌ8 | No connection | Not used. |

| Terminal No. | Symbol | Name | Function/operation |
|---|---|---|---|
| 6. | $C\overline{O}7$ | Muting |  <br>"L" level 0.4 to 0.5 second after "PLAY" finish. "H" level in PAUSE, FF, REW STOP.<br>"L" level approx. 0.4 second after "REC PAUSE" is switched to REC. "L" level approx. 0.4 second after command in case PAUSE mode is set to REC command. |
| 7. | $C\overline{O}6$ | REC indication |  <br>"H" level simultaneously with REC indication.<br>"H" level immediately after power is ON in TIMER REC mode.<br>"H" level held if in TIMER REC position, when STOP AUTO RESET mechanism operates. |
| 8. | $C\overline{O}5$ | PLAY indication |  <br>"H" level simultaneously with PLAY indication.<br>Same as the above for TIMER PLAY. |
| 9. | $C\overline{O}4$ | PAUSE indication |  <br>"H" level simultaneously with PAUSE indication. |
| 10.<br>11.<br>12.<br>13. | $C\overline{O}3$<br>$C\overline{O}2$<br>$C\overline{O}1$<br>$C\overline{O}\phi$ | FL grid & input SW. scan |  |

| Terminal No. | Symbol | Name | Function/operation |
|---|---|---|---|
| 14. | A13 | Input switch state reading | Reads switch states corresponding to scanning of CO $\phi$ — 3 (when the cassette half detection leaf switch (S605) is ON, this terminal is connected to the HALL IC, MUSIC SELECT switch (S512) and SET switch (S511)). |
| 15. | A12 | Input switch state reading | Reads switch states corresponding to scanning of CO $\phi$ — 3 (when the mode leaf switch (S602) is ON, this terminal is connected to the accidental erasing protection leaf switch (S601), memory repeat switch (S509), TAPE/TIME switch (S510) and TIMER PLAY switch (S513)). |
| 16. | A11 | Input switch state reading | Reads switch states corresponding to scanning of CO $\phi$ — 3 (when the play leaf switch (S604) is ON, this terminal is connected to the REC MUTE switch (S508)). |
| 17. | A1$\phi$ | Input switch state reading | Reads switch states corresponding to scanning of CO $\phi$ — 3 (when the stop leaf switch (S603) is ON, this terminal is connected to the counter reset switch (S501). |
| | | | Operation example<br>Counter reset switch (S501) and stop switch (S603) are connected to A10. If only S603 is closed, the waveform is as follows:<br>  <br><br>Cassette half detection switch (S605), HALL IC output, MUSIC SELECT switch (S512) and SET switch (S511) are connected to A13. If all switches are OFF, the following waveform is obtained in FF or REW mode.<br>  <br> |
| 18.<br>19.<br>20.<br>21. | Bi3<br>Bi2<br>Bi1<br>Bi$\phi$ | REW key<br>FF key<br>PLAY key<br>STOP key |  <br><br>"H" in the normal case,<br>"L" when the switch is pushed. |
| 22. | EO$\phi$ | Brake plunger |  <br><br>"H" during FF/REW operations. |
| 23. | EO1 | Trigger plunger |  <br><br>"H" until MODE SW is closed after the input to switch the mechanism, such as PLAY, PAUSE, STOP, etc. has been applied. (Approx. 70ms. depending on the mechanism condition.) |

| Terminal No. | Symbol | Name | Function/operation |
|---|---|---|---|
| 24. | $E\overline{O}2$ | Motor CL |  <br>"H" until MODE SW is changed from "close" to "open" following the indication that the mechanism mode has been changed.<br>  <br>"H" in REW operation. |
| 25. | $E\overline{O}3$ | Motor UNCL | Same as the above in MODE conversion.<br>"H" during FF (Cue). |
| 26. | TST | Chip test | Connected to GND. |
| 27. | RST | RESET | Computer's RESET terminal.<br>Reset is less than 0.8V.<br>  |
| 28. | CSLCT | CSLCT | Connected to GND. |
| 29. | SNS$\phi$ | Input switch state reading | Reads switch states corresponding to scanning of CO $\phi$ — 3. (This terminal is connected to REC switch (S503), PAUSE switch (S502), switch detecting pulses between signal portions and TIMER REC switch (S513). |
| 30. | SNS1 | Reference signal reading | Time caount reference signal: approx. 1446 Hz |
| 31.<br>32.<br>33.<br>34.<br>35.<br>36.<br>37. | $D\overline{O}\phi$<br>$D\overline{O}1$<br>$D\overline{O}2$<br>$D\overline{O}3$<br>$D\overline{O}4$<br>$D\overline{O}5$<br>$D\overline{O}6$ | FL counter Segment a<br>FL counter Segment b<br>FL counter Segment c<br>FL counter Segment d<br>FL counter Segment e<br>FL counter Segment f<br>FL counter Segment g |  <br>Counter number changes when takeup reel table rotates two turns. Each segment of running indication changes when the reel table rotates a half turn.<br>Waveforms change since dynamic lighting is used. |

| Terminal No. | Symbol | Name | Function/operation |
|---|---|---|---|
| 38. | DO7 | No connection | Not used. |
| 39. | VDD | Power source | Operated at 4.5V to 6.0V. |
| 40. | OSC | Oscillation terminal |  <br>Oscillation is approx. 370 kHz. Because the connection of a probe affects the terminal, nothing should be connected to this terminal for any other measurements.<br>Use COϕ to 3 in measuring the computer's velocity; Approx. 100 Hz in STOP condition. |

# TROUBLESHOOTING OF MAIN CONTROL CIRCUIT

| Fault | Probable cause | Microcomputer terminal to check | Relevant mechanism parts | Relevant external parts |
|---|---|---|---|---|
| **Mechanism dose not operate at all.** | | | | |
| FL not lighting | Microcomputer not operating | | | |
| | Power not supplied. | 39 (VDD) | | |
| | Clock not oscillating. | 40 (OSC<br>10 to 13 | | C503, C504<br>VR501 to R514 |
| | Reset locked. | 27 (RST) | | C511, C506, Q506, Q401, R513, R512 |
| | Microcomputer normal. (Scan normal) | | | |
| | Connection to FL Driver. | 10 to 13<br>31 to 37 | | |
| FL lighting OK. (MODE LED not lighting.) | Half SW. closed. | 14 (Ai3) | Half SW. | D502 |
| MODE indicator lighting OK. | Motor circuit faulty. | 24, 25 | Motor connection | IC502 |

| Fault | Probable cause | Microcomputer terminal to check | Relevant mechanism parts | Relevant external parts |
|---|---|---|---|---|
| **Mechanism defective.** | | | | |
| FF/REW reverse rotation. | Reverse connection of motor. | 24, 25 | Motor connection | IC502 |
| FF/REW motor rotating, reel not rotating. | Brake plunger not being with drawn. | 22 (EOϕ) | Brake plunger disconnection, etc. | IC502 |
| CAM continuous rotation in PLAY. | MODE SW. defective. | 15 (Ai2) | MODE SW. | D505, D501 |
| Motor rotating in PLAY, but CAM's not switched. | Trigger plunger not operating | 23 (EO1) | Trigger plunger | IC502 |
| Motor rotates in reveise and does not stop after switching to PLAY or PAUSE. | PLAY or STOP SW, defective. | 16 (Ai1)<br>17 (Aiϕ) | STOP PLAY Leaf SW. | D504, Q502<br>D503, D511 |
| REC IND. due not light up. (Operation is normal) | LED or drive transistor defective. | 7 (CO6) | | IC502 |
| PLAY IND. dues not light up. | -do- | 8 (CO5) | | IC502 |
| PAUSE IND. dues not light up. | -do- | 9 (CO4) | | IC502 |
| Not counting. | Hall IC faulty, buffer circuit faulty. | 14 (Ai3) | Reel magnet | IC503 (Hall IC)<br>Q501, D502 |
| AUTO STOP functioning soon after operation begins. | Same as the above. (Not counting) | | | |
| No muting. | Muting output connection etc. | 6 (CO7) | | |
| No peak-resetting. | Connection | 3 (CO10) | | Q301 |
| Accidental erase prevention mechanism not functioning. | Leaf SW | 15 (Ai2) | Accidental erasure Leaf SW | D501, 505 |
| Operating during EJECT. | Half detection SW. | 14 (Ai3) | Half detection SW. | D502 |

# OUTLINE OF dbx SYSTEM

In 1971, the dbx company of Massachusetts, U.S.A., succeeded in developing a logarithmic compression/expansion system for audio signals which extends across an extremely wide amplitude range and results in a very low distortion rate.
In this system, the dynamic range of the input signal is compressed to 1/2 its original level (measured in decibels), and then recorded. The recorded signal is then expanded (2x) prior to playback, in order to restore it to the original level. By this process, a dynamic range exceeding 100dB can be easily obtained by using an ordinary tape recorder.
This system is referred to as a decilinear noise reduction system, but is generally called the "dbx system", the name being derived from the dbx company.

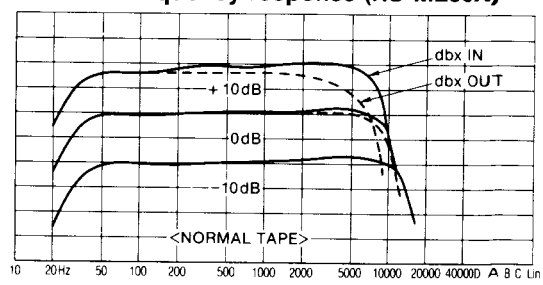
## • The features of the dbx system

1. A significant noise reduction (approximately 30dB or more) is obtained over the entire audible frequency range.

| Noise reduction mode | S/N ratio RS-M255X | Remarks |
|---|---|---|
| Noise reduction "OUT" | 58dB | $CrO_2$ tape, peak level |
| Dolby NR "IN" | 66dB | $CrO_2$ tape, peak level |
| dbx "IN" | 92dB | $CrO_2$ tape, peak level |

2. A great improvement in the dynamic range makes it possible to extend the range to 110dB (at 1kHz, $CrO_2$ tape).
3. The direct logarithmic method of compression and expansion protects against problems caused by level mismatching.
4. Even if phase distortion occurs in the signal transmission system, precise operation is maintained by means of the RMS level detector.
5. A low distortion rate is maintained throughout the frequency range.
   - Improvement of high frequency response. The dbx system solves the problem of deteriorated high frequency at higher input levels which is an inherent fault of cassette tape equipment. The response at approx. 8,000Hz at 10dB input is improved as much as 14dB. As a result, flatter response is obtained at both low and high input levels.

**Overall frequency response (RS-M255X)**

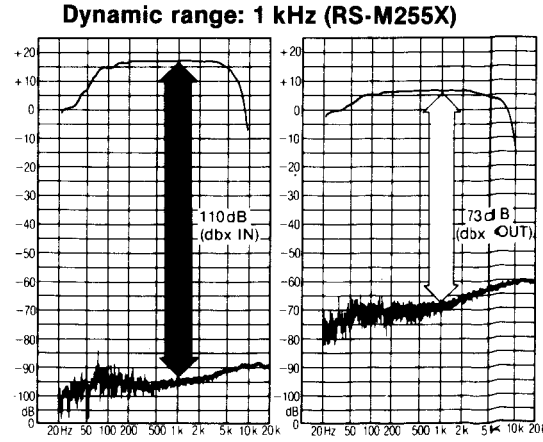



## • Remarkable dynamic range of 110dB

**About dynamic range:**

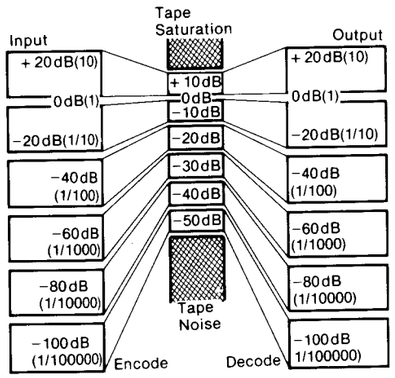
The dynamic range refers to the output range of an audio transmission system, extending from the lowest recognizable level to the highest possible level produced. Dynamic range is one of the values used to express the degree of fidelity of an audio transmission system.

**Dynamic range: 1 kHz (RS-M255X)**

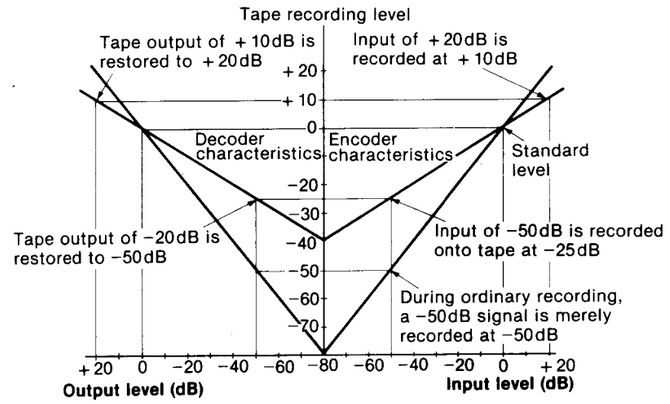


- **Compressing the dynamic range to 1/2 before recording, and then expanding it (by 2x) before playback produces the remarkable dynamic range of the dbx system.**
  - The dynamic range of cassette tape with a saturation level of +10dB and a noise level of −45dB (such as Technics $CrO_2$ position tape) is 55dB. Any sounds with a level greater than +10dB will result in considerable distortion, and any sounds less than −45dB will be inaudible due to the effect of noise, making high-fidelity reproduction impossible.
    The dbx system, however, linearly compresses the input level by a ratio of 1/2 in decibels prior to recording it onto the tape. A +20dB sound is thus compressed to +10dB, a −20dB sound is compressed to −10dB, and a −90dB sound is compressed to −45dB.
    As a result, a signal with a dynamic range extending from −90dB to +20dB (a 110dB dynamic range) can be contained within a range which extends from −45dB to +10dB (a 55dB dynamic range). Recording onto a cassette tape with a 55dB dynamic range is then possible.
    Prior to playback, the exact opposite process occurs and the sound levels are expanded. The +10dB sound is restored to its original level of +20dB, the −10dB sound is restored to −20dB, and the −45dB sound is restored to −90dB.
    Therefore, the basic principle of the dbx system, as described above, is to compress the 110dB dynamic range by 1/2 to 55dB prior to recording, and then the expand it (by 2x) prior to playback.

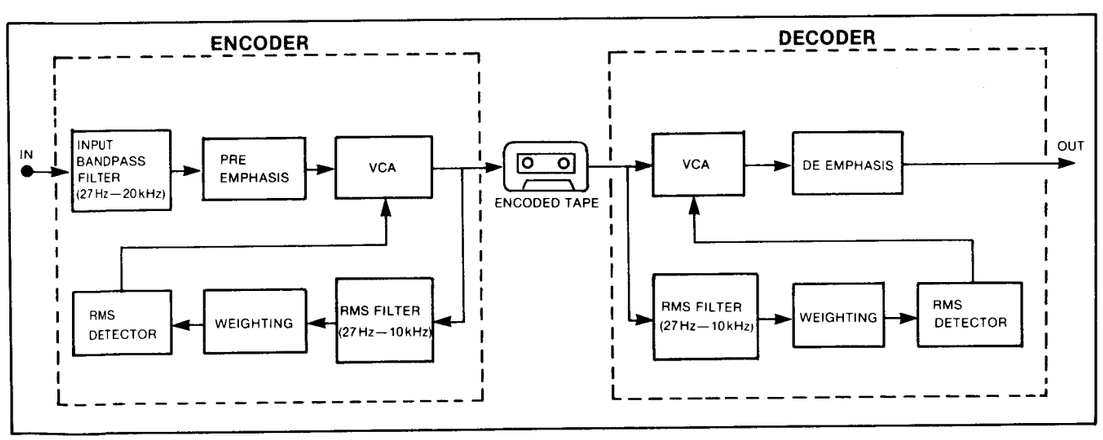
**dbx system function diagram**




**Level compression/expansion diagram**




## THE BLOCK DIAGRAM OF dbx SYSTEM




(Block configuration change for dbx circuit Encode/Decode is electrically performed by switching transistors between blocks.)



# ENCODER

- The portion of the dbx system with compresses the volume level of the input signal by 1/2 (measured in decibels), before seding it to the recording system, is called the encoder.

### ① INPUT BANDPASS FILTER (27Hz—20kHz)

To prevent pulse noise or other types of interference from causing erroneous operation of the dbx system, all signals outside the 27Hz—20kHz audio band range are eliminated here.

### ② PRE-EMPHASIS

The high frequency range, where hiss noise is prominent, is emphasized here during recording. The end result is that, although the dbx system is effective in reducing noise across entire frequency band, noise in the high frequency range is reduced still more by this pre-emphasis circuitry.

### ③ VCA (voltage-controlled amplifier/attenuator)

This is an extremely important circuitry in the construction of the dbx system. In response to the incoming DC control voltage, the VCA varies the degree of amplification logarithmically in the same manner as the direct current, resulting in compression and expansion of the input signal's dynamic range.

### ④ RMS DETECTOR (RMS: root mean square)

This is an important element in the composition of the dbx system, because its circuitry generates a DC voltage (the voltage that controls the degree of amplification in the VCA) in proportion to the size of the input signal.
It does this by detecting the root mean square value of the input signal, and then converting it to a DC voltage in proportion to the logarithm of the detected level.
Erroneous operation due to phase shift is prevented by monitoring of the voltage level derived from the root mean square value.

### ⑤ WEIGHTING

To prevent the saturation level of the tape deck in high frequencies, this increases the RMS DETECTOR high frequency sensitivity and decreases the VCA high frequency gain. As a result, the linearity of the tape deck is enhanced in the high frequency range.

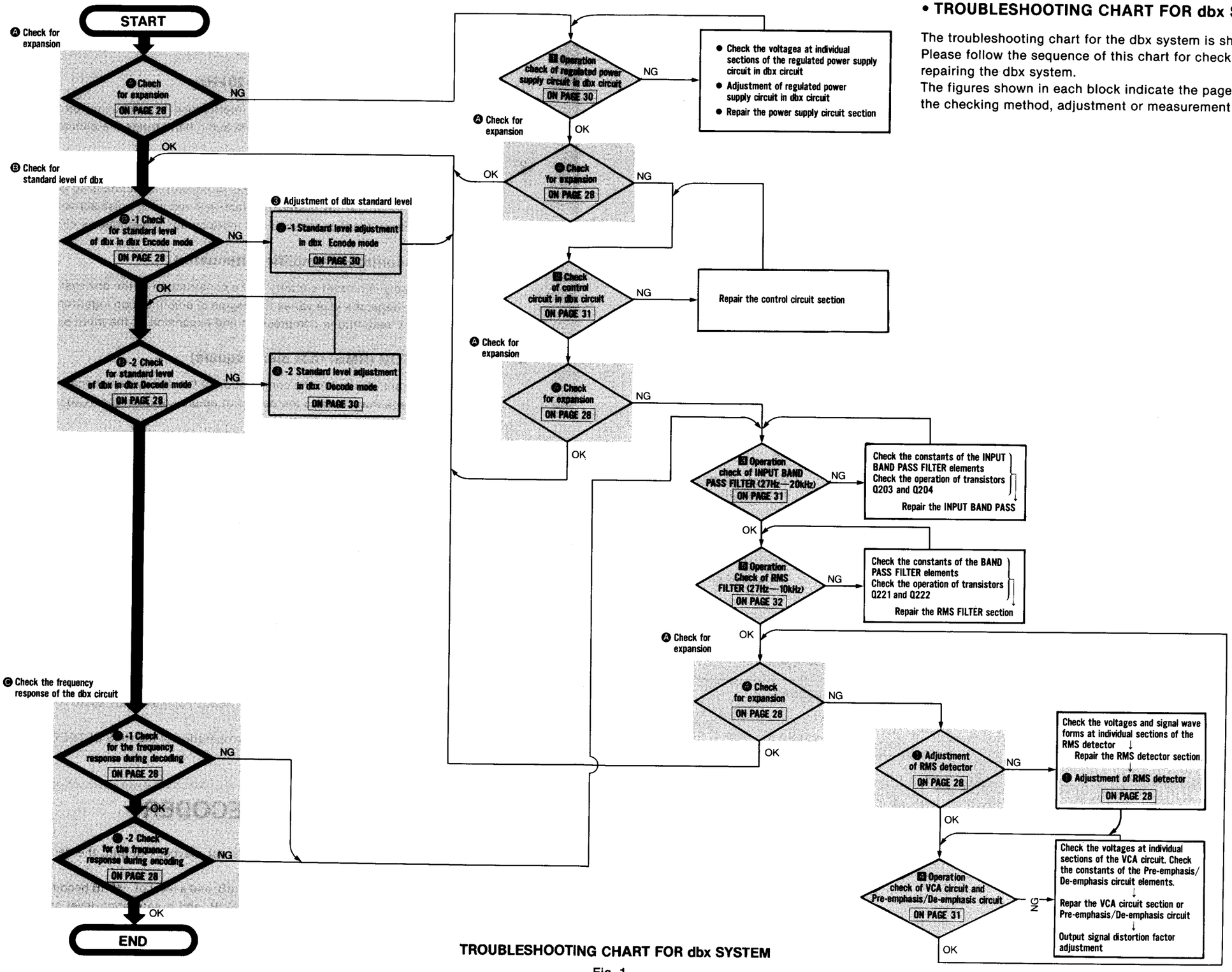
### ⑥ RMS FILTER (27Hz to 10kHz)

This filter cuts any signal other than 27Hz to 10Hz that mixes in input signals to prevent the RMS DETECTOR from malfunctioning. Those to be cut include an FM tuner STEREO PILOT signal, tape deck bias leakage and record player motor rotational noise. In addition, the signal in the frequency range (27Hz to 10kHz) passing through the BAND PASS FILTER is comparatively small in level variations when handled by the tape deck.
This ensures correct complementarity in the operation of the RMS DETECTOR and VCA during Encoding and Decoding.

# DECODER

As shown in the diagram on the previous page, for playback output, the decoder expands the constantly changing level to double the decibel range.
For example, 2 −30dB signal is expanded to −60dB, and a level of −45dB becomes −90dB. On the other hand, a playback output +10dB is expanded to +20dB, and a saturation level signal is also correspondingly increased.
In terms of the system's operation, the decoder's function is the exact opposite of the function of the previously mentioned encoder.

# MEASUREMENT AND ADJUSTMENT METHODS (FOR dbx SYSTEM)




**TROUBLESHOOTING CHART FOR dbx SYSTEM**

Fig. 1

## • TROUBLESHOOTING CHART FOR dbx SYSTEM

The troubleshooting chart for the dbx system is shown in Fig. 1. Please follow the sequence of this chart for checking and repairing the dbx system.
The figures shown in each block indicate the page on which the checking method, adjustment or measurement is explamed.

## • ADJUSTMENT PARTS LOCATION OF dbx SYSTEM

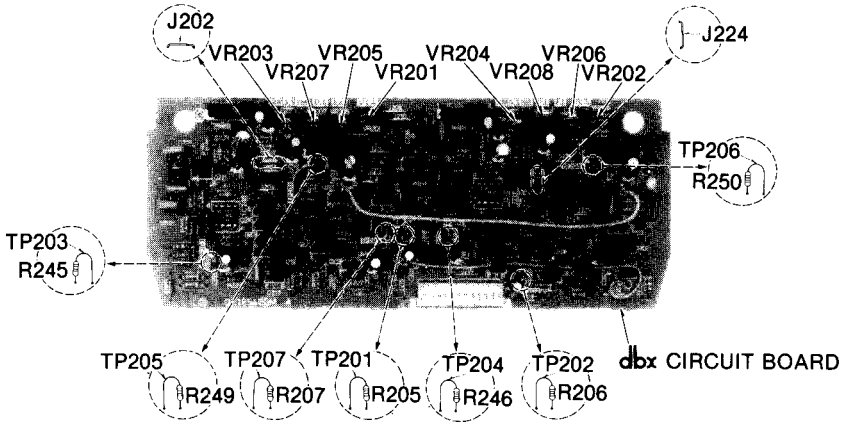



Fig. 2

# BLOCK DIAGRAM OF dbx SECTION (L-CH ONLY)

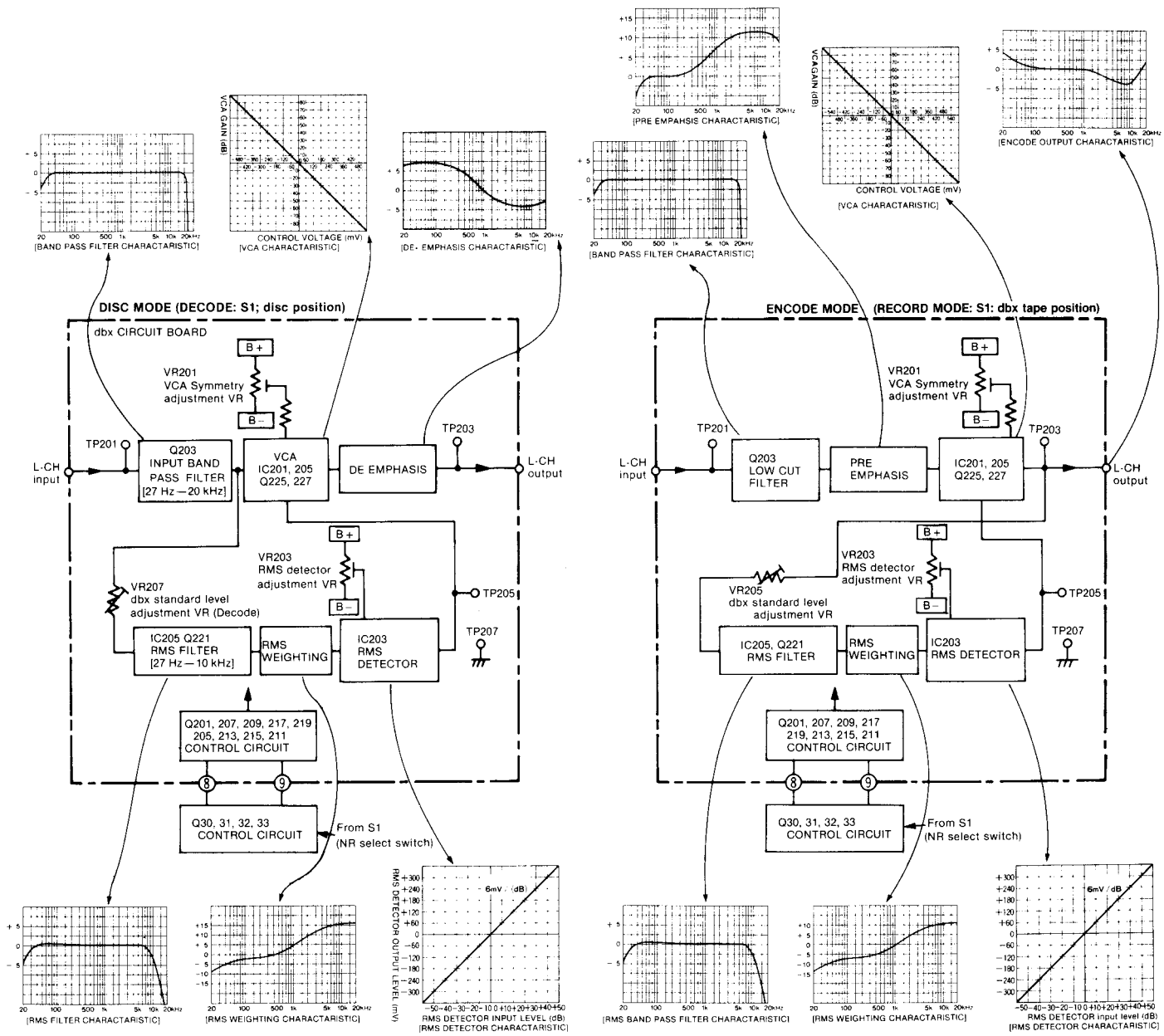


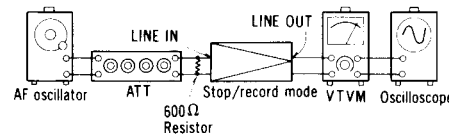
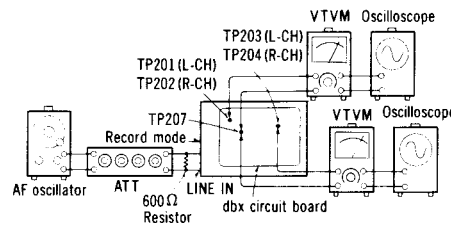

Fig. 3

**Note:** Encode/decode selection of the dbx circuit in RS-M255X is done with a control circuit, composed of transistors. (This control circuit is interlocked with S1 (NR selection switch).)

# dbx SYSTEM CHECKING METHOD

NOTES: Keep good condition, set switches and controls in the following positions, unless otherwise specified.

- Input level controls: Maximum
- Output level control: Maximum

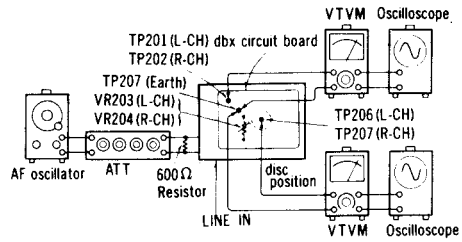
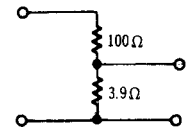
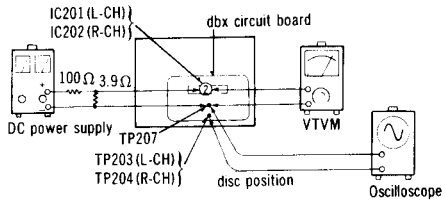
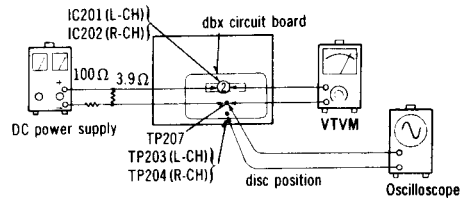
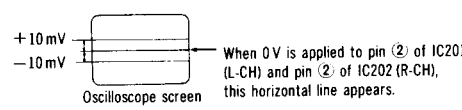
| ITEM | CHECKING METHOD |
|---|---|
| **Ⓐ Check for expansion**<br>Condition:<br>* Stop mode<br>* Input level controls ··· MAX<br>* Output level control ··· MAX<br>* Noise reduction selector ··· disc/dbx tape<br>Equipment:<br>* VTVM * AF oscillator<br>* ATT * Oscilloscope<br>* Resistor (600Ω) | **Ⓐ Check for expansion**<br>1. Make the connections as shown in fig. 4 and apply 1kHz −27dB signal from LINE IN, and set the noise reduction selector to disc position.<br>2. Adjust ATT, increase input signal level by 10dB, and make sure that the reading for VTVM increases by 20dB±1dB.<br>3. Adjust ATT, decrease the input signal level, and make sure that the reading for VTVM decreases by 20dB±1dB.<br>  <br>Fig. 4 |
| **Ⓑ Check for standard level of dbx**<br>Condition:<br>* Stop/record mode<br>* Input level controls ··· MAX<br>* Noise reduction selector ··· disc/dbx tape<br>Equipment:<br>* VTVM * AF oscillator<br>* ATT * Oscilloscope<br>* Resistor (600Ω) | **Ⓑ-1 Check for standard level of dbx in dbx Encode mode**<br>1. Make the connections as shown in fig. 5 and apply 1kHz −27dB signal from LINE IN, and set the noise reduction selector to dbx tape position.<br>2. Set the unit to record mode, adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300mV.<br>3. Make sure that the signal level at TP203 (L-CH) and TP204 (R-CH) is 300mV±0.5dB.<br>  <br>Fig. 5<br>**Ⓑ-2 Check for standard level of dbx in dbx Decode mode**<br>1. Make the connections as shown in fig. 5 and apply 1kHz −27dB signal from LINE IN, and check as follows:<br>2. Set the noise reduction selector to disc position and adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300mV.<br>3. Make sure that the signal level at TP203 (L-CH) and TP204 (R-CH) is 300mV±0.5dB. |
| **Ⓒ Check the frequency response of the dbx circuit**<br>Condition:<br>* Stop/record mode<br>* Input level controls ··· MAX<br>* Noise reduction selector ··· disc/dbx tape<br>Equipment:<br>* VTVM * AF oscillator<br>* ATT * Oscilloscope<br>* Resistor (600Ω) | **Ⓒ-1 Check the frequency response during decoding**<br>1. Make the connections as shown in fig. 5 and apply 1kHz −27dB signal from LINE IN, and check as follows:<br>2. Set the noise reduction selector to disc position, and adjust ATT so that te signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300mV.<br>3. With the signal level at TP203 (L-CH) and TP204 (R-CH) as 0dB, change the signal frequency to 100Hz, 20Hz and 7kHz respectively. Read signal levels at TP203 (L-CH) and TP204 (R-CH) and check that they are within the specifications-1.<br>Specifications-1<br>Frequency / Signal levels at TP203 and TP204<br>1kHz: 0dB (300mV)<br>100Hz: −0.5dB±1dB<br>20Hz: −30dB±5dB<br>7kHz: +7dB±1dB<br>**Ⓒ-2 Check the frequency response during encoding**<br>1. Make the connections as shown in fig. 5 and apply 1kHz −27dB signal from LINE IN, and check as follows:<br>2. Set the noise reduction selector to dbx tape position, and the unit to record mode.<br>3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300mV.<br>4. With the signal level at TP203 (L-CH) and TP204 (R-CH) as 0dB, change the signal frequency to 100Hz and 7kHz respectively. Read signal levels at TP203 (L-CH) and TP204 (R-CH) and check that they are within the specifications-2.<br>Specifications-2<br>Frequency / Signal levels at TP203 and TP204<br>1kHz: 0dB (300mV)<br>100Hz: +0.5dB±1dB<br>7kHz: −3.5dB±1dB |

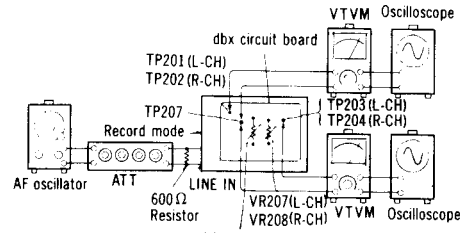
NOTES:

- If the results of the above checks Ⓐ, Ⓑ and Ⓒ do not satisfy the specifications, perform the following adjustments.
- If the specifications are not satisfied even after the adjustments, follow the checking procedure for problems.
- If the output signal is not produced or is extremely distorted, follow the checking procedure for problems.

# ADJUSTMENT OF dbx SYSTEM

NOTES: When adjusting the circuit of the dbx system, be sure to perform the adjustments in the following order:
❶ Adjustment of RMS detector. ❷ Adjustment of VCA. ❸ Adjustment of dbx standard level.
Keep good condition, set switches and controls in the following positions, unless otherwise specified.
• Input level controls: Maximum

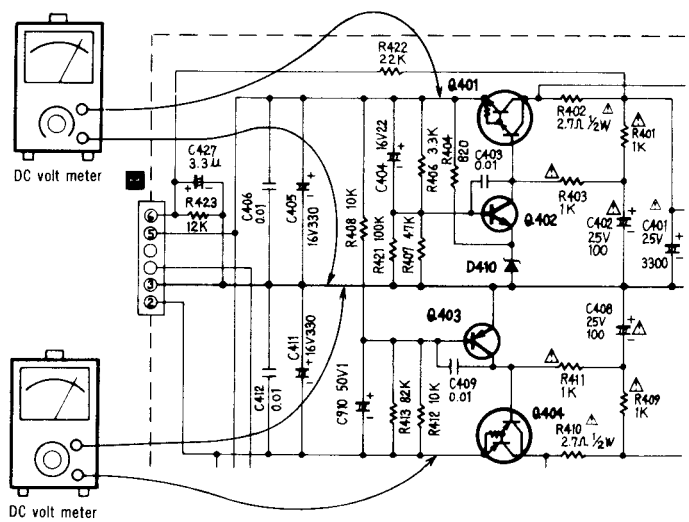
| ITEM | ADJUSTMENT |
|---|---|
| **❶ Adjustment of RMS detector**<br>Condition:<br>* Stop mode<br>* Input level controls ··· MAX<br>* Noise reduction selector ··· disc<br>Equipment:<br>* VTVM * AF oscillator<br>* ATT * Oscilloscope<br>* Resistor (600Ω) | 1. Make the connections as shown in fig. 6, and set the noise reduction selector to disc position.<br>2. Apply 100Hz −27dB signal from LINE IN.<br>3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300mV.<br>4. Make sure that the output signal at TP205 (L-CH) and TP206 (R-CH) is at 200Hz sine wave.<br>If the output signal is not sinusoidal as shown in fig. 7, adjust VR203 (L-CH) and VR204 (R-CH) to make it sinusoidal.<br>**NOTE:**<br>The voltage of the output signal after adjustment is about 0.5mV rms.<br>  <br><br>**Fig. 6**<br>  <br><br>**Fig. 7** |
| **❷ Adjustment of VCA**<br>Condition:<br>* Record/stop mode<br>* Input level controls ··· MAX<br>* Noise reduction selector ··· disc/dbx tape<br>Equipment:<br>* VTVM * Oscilloscope<br>* Resistor (100Ω, 3.9Ω) | **Preparation before adjustment**<br>1. Before adjusting VCA, from the device shown below using resistors of 100Ω and 3.9Ω (See fig. 8)<br>2. Set NR switch to dbx disc.<br>Remove jumpers [J202 (L-CH) and J224 (R-CH)].<br>3. Arrange connections referring to wire connection diagram (fig. 9 and 10), since 0V, +180mV and −180mV (DC) are applied in this order to pin 2 of IC201 (L-CH) and pin 2 of IC202 (R-CH).<br>  <br><br>**Fig. 8**<br>  <br><br>**Connections when applying +180mV and 0V**<br>Adjust DC power supply and arrange connections so that +180mV or 0V can be applied to TP203 (L-CH) and TP204 (R-CH).<br>**Fig. 9**<br>  <br><br>**Connections when applying −180mV**<br>Adjust DC power supply and arrange connections so that −180mV can be applied to TP203 (L-CH) and TP204 (R-CH).<br>**Fig. 10**<br>**Adjustment procedure**<br>1. Apply 0V to pin ② of IC201 (L-CH) and pin ② of IC202 (R-CH), and a horizontal line will appear on the screen of the oscilloscope. Use this line as the reference line.<br>2. Apply +180mV to pin ② of IC201 (L-CH) and pin ② of IC202 (R-CH) (See fig. 9), and check that the level is not more than 10mV from the reference line. If improper, adjust VR201 (L-CH) and VR202 (R-CH).<br>3. In the same way, apply −180mV to pin ② of IC201 (L-CH) and pin ② of IC203 (R-CH) (See fig. 10), and check that the level is not more than 10mV from the reference line. If improper, adjust VR201 (L-CH) and VR202 (R-CH).<br>4. Repeat steps 2 and 3, and adjust VRs so that the levels are within ±10mV when +180mV and −180mV are applied (fig. 11).<br>5. After adjustment, connect jumpers J202 (L-CH) and J224 (R-CH) (See fig. 2).<br>  <br><br>**Fig. 11** |
| **❸ Adjustment of dbx standard level**<br>Condition:<br>* Record/stop mode<br>* Input level controls ··· MAX | **NOTE:**<br>Be sure to perform the standard level adjustment in dbx Encode, followed by the standard level adjustment in dbx Decode. |

| ITEM | ADJUSTMENT |
|---|---|
| * Noise reduction selector ··· disc/dbx tape<br>Equipment:<br>* VTVM * AF oscillator<br>* ATT * Oscilloscope<br>* Resistor (600Ω) | ❸-1 Standard level adjustment in dbx Encode mode<br>1. Make the connection as shown in fig. 12 and apply 1kHz −27dB signal from LINE IN, and set the noise reduction selector to dbx tape position.<br>2. Set unit to record mode, adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300mV.<br>3. Adjust VR205 (L-CH) and VR206 (R-CH) so that the output signal level at TP203 (L-CH) and TP204 (R-CH) becomes 300mV±0.5dB.<br>  <br><br>Fig. 12<br>❸-2 Standard level adjustment in dbx Decode mode<br>1. Make the connection as shown in fig. 12 and apply 1kHz −27dB signal from LINE IN, and perform the following adjustments.<br>2. Set the noise reduction selector to disc position, and adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300mV.<br>3. Adjust VR207 (L-CH) and VR208 (R-CH) so that the output signal level at TP203 (L-CH) and TP204 (R-CH) becomes 300mV±0.5dB. |

NOTES:
- After adjustments ❶, ❷ and ❸, re-check according to "dbx SYSTEM CHECKING METHOD".
- If the specifications are not satisfied, perform the adjustments again.

# CHECKING PROCEDURE FOR PROBLEMS

NOTES: Find defective parts according to the circuit operation checking method given below, and use the results for your reference during repair. Remember to adjust after repair.
Keep good condition, set switches and controls in the following positions, unless otherwise specified.
- Input level controls: Maximum

| ITEM | CHECKING METHOD |
|---|---|
| ❶ Operation check of regulated power supply circuit in dbx circuit<br>Equipment:<br>* DC volt meter<br>* Oscilloscope | ❶-1 Check of +10.5V voltage<br>Make the connection as shown in fig. 13 and make sure that the emitter voltage of Q401 is around +10.5V.<br>❶-2 Check of −10.5V voltage<br>Make the connection as shown in fig. 13 and make sure that the emitter voltage of Q404 is around −10.5V.<br>  <br><br>Fig. 13 |

| ITEM | CHECKING METHOD |
|---|---|

**2** Check of control circuit in dbx circuit

Equipment:
* DC volt meter

**E.C.B (G.S.D) voltage check of each switching transistor for Encode/Decode**

The terminal voltage of each switching transistor in Encode/Decode mode are shown in the table below.

| Transistor Ref. No. | Encode (dbx tape) | | | Decode (dbx tape) | | | disc | | |
|---|---|---|---|---|---|---|---|---|---|
| | E (G) | C (S) | B (D) | E (G) | C (S) | B (D) | E (G) | C (S) | B (D) |
| Q30 | 0V | 0.015V | 0.62V | −0.001V | 1.168V | 0.017V | 0V | 0.58V | 0.018V |
| Q31 | 0V | 10.66V | −0.001V | −0.001V | 0.006V | 0.65V | −0.001V | 0.006V | 0.65V |
| Q32 | 10.78V | 10.62V | 10.72V | 10.77V | 10.75V | 10.1V | 10.78V | 10.74V | 10.1V |
| Q33 | −10.72V | 5.97V | −10.67V | −10.72V | −10.70V | −10.04V | −10.73V | −10.70V | −10.04V |
| Q3 | 0.074V | −0.029V | 0V | 1.69V | 1.64V | 0.99V | 0.055V | −0.035V | 0V |
| Q11, 12 | −10.8V | 0V | 0V | 0.65V | 0.04V | 0.04V | 0.65V | 0.04V | 0.04V |
| Q13, 14 | 0.58V | 0V | 0V | −10.8V | 0.04V | 0V | −10.8V | 0.04V | 0V |
| Q201, 202 | −10.8V | 0V | 0V | +0.43V | 0V | 0V | −10.8V | 0V | 0V |
| Q205, 206 | 0V | −1.45V | −10.62V | −1.42V | −1.42V | −0.77V | −1.42V | −1.42V | −0.77V |
| Q207, 208 | −1.45V | −1.45V | −0.83V | 0V | −1.42V | −10.7V | 0V | −1.42V | −10.71V |
| Q209, 210 | 0V | 0V | 0.61V | −0.15V | 0V | −10.7V | 0V | 0V | −10.7V |
| Q211, 212 | −0.11V | 0V | −10.61V | 0V | 0V | 0.63V | 0V | 0V | 0.64V |
| Q213, 214 | 0V | −0.1V | −10.56V | 0V | −0.1V | −10.56V | −0.29V | −0.29V | 0.33V |
| Q215, 216 | −0.1V | −0.1V | 0.47V | 0V | −0.1V | −10.65V | 0V | −0.29V | −10.65V |
| Q217, 218 | 0V | 0.01V | −10.62V | 0V | 0V | 0.64V | 0V | 0V | 0.64V |
| Q219, 220 | 0.01V | 0V | 0.62V | −1.42V | 0V | −10.7V | −1.42V | 0V | −10.71V |
| Q223, 224 | −10.75V | −10.54V | −10.61V | −10.72V | 10.64V | −10.62V | −10.77V | −10.76V | −10.12V |

NOTE:
• If no abnormality is found in steps **1** and **2**, check the operation for each part as follows:

**3** Operation check of INPUT BAND PASS FILTER circuit (27Hz—20kHz)

Condition:
* Record mode
* Input level controls ··· MAX
* Noise reduction selector ··· dbx tape

Equipment:
* VTVM
* AF oscillator
* ATT
* Oscilloscope
* Resistor (600Ω)

1. Make the connections as shown in fig. 14, and apply 100Hz −27dB signal from LINE IN, and set the noise reduction selector to dbx tape position.
2. Set the unit to record mode.
3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300mV.
4. Make sure that the emitter signal level of Q203 (L-CH) and Q204 (R-CH) is 300mV.
5. Set the input signal frequency to 5kHz and make sure that the emitter signal of Q203 (L-CH) and Q204 (R-CH) remains at the same level (300mV).

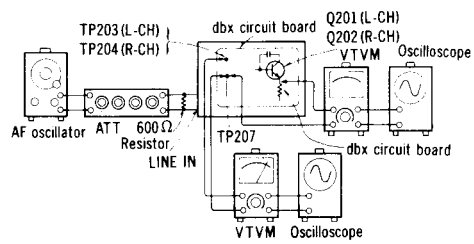



Fig. 14

**4** Operation check of VCA circuit and Pre-emphasis/ De-emphasis circuit

Condition:
* Stop/record mode
* Input level controls ··· MAX
* Noise reduction selector ··· disc/dbx tape

Equipment:
* VTVM
* AF oscillator
* ATT
* Oscilloscope
* Resistor (600Ω)

**4**-1 Operation check of VCA circuit and Pre-emphasis circuit

1. Make the connections as shown in fig. 15, and apply 100Hz −27dB signal from LINE IN.
2. Short pin ③ of IC201 (L-CH) and IC202 (R-CH) to TP207 (ground) as shown in fig. 16.
3. Set the unit to record mode, and set the noise reduction selector to dbx tape position.
4. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300mV.
5. Make sure that the output signals at TP203 (L-CH) and TP204 (R-CH) are sinusoidal. (The operation of VCA can then be checked.)
6. Shift the frequency of input signal to 5kHz, and make sure that the output signal levels at TP203 (L-CH) and TP204 (R-CH) are increased by about 12dB. (The operation of the Pre-emphasis circuit can then be checked.)

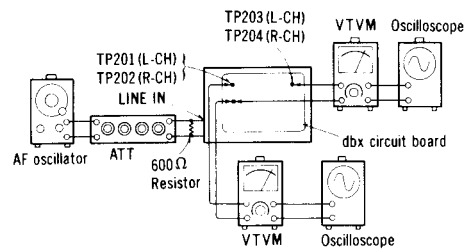



Fig. 15

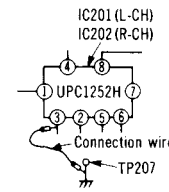
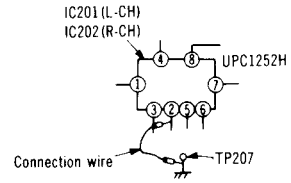
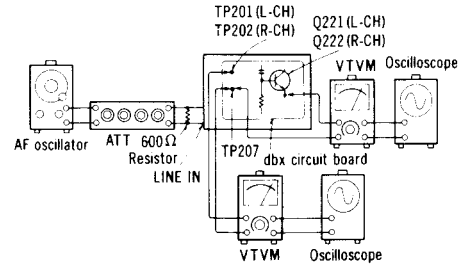
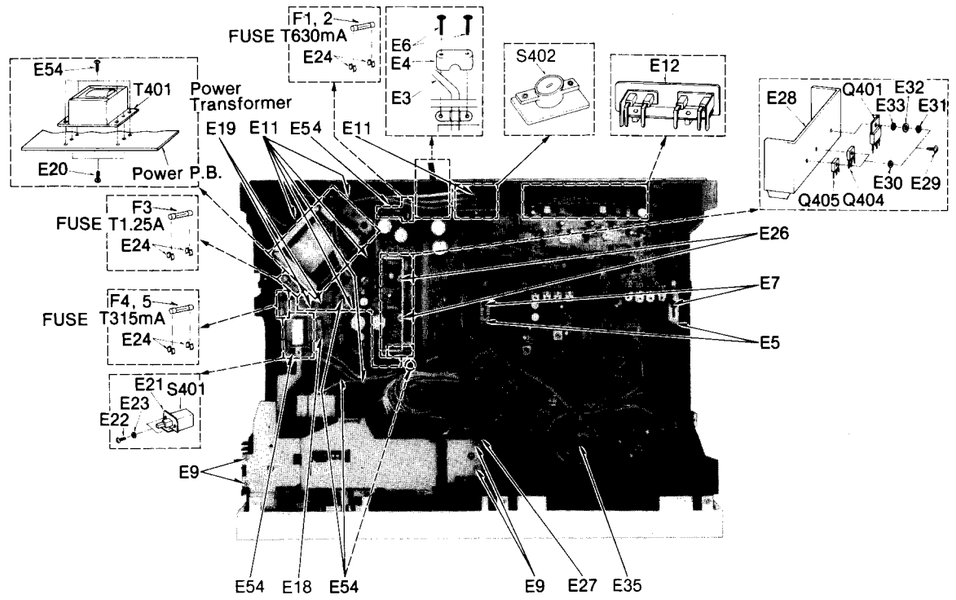
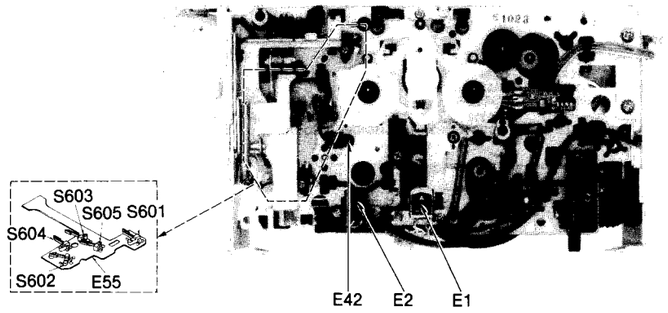


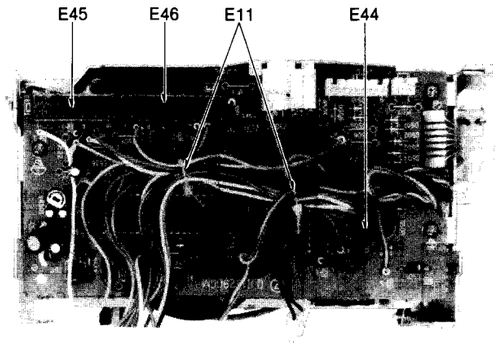

Fig. 16

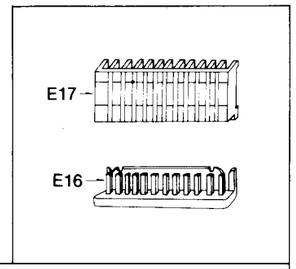
| ITEM | CHECKING METHOD |
|---|---|
| | **4**-2 Operation check of VCA circuit and De-emphasis circuit<br>1. The procedure is the same as 1 for the above **4**-1 VCA circuit and Pre-emphasis circuit.<br>2. Short pin ② of IC201 (L-CH) and IC202 (R-CH) to TP207 (ground) as shown in fig. 17.<br>3. Set the noise reduction selector to disc position.<br>4. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV.<br>5. Make sure that the output signals at TP203 (L-CH) and TP204 (R-CH) are sinusoidal. (The operation of VCA can then be checked.)<br>6. Change the frequency of input signal to 5 kHz and make sure that the output signal level at TP203 (L-CH) and TP204 (R-CH) is decreased by about 12 dB. (The operation of the De-emphasis circuit can then be checked.)<br>  <br>Fig. 17 |
| **5** Operation check of RMS FILTER circuit (27 Hz—10 kHz)<br>Condition:<br>* Stop mode<br>* Input level controls ··· MAX<br>* Noise reduction selector ··· disc<br>Equipment:<br>* VTVM * AF oscillator<br>* ATT * Oscilloscope<br>* Resistor (600 Ω) | 1. Make the connections as shown in fig. 18, and apply 100 Hz −27 dB signal from LINE IN.<br>2. Set the noise reduction selector to disc position.<br>3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV.<br>4. Make sure that the emitter signal level of Q221 (L-CH) and Q222 (R-CH) is around 300 mV.<br>5. Change the frequency of input signal to 5 kHz and make sure that the emitter signal of Q221 (L-CH) and Q222 (R-CH) remains at the same level (300 mV).<br>  <br>Fig. 18 |

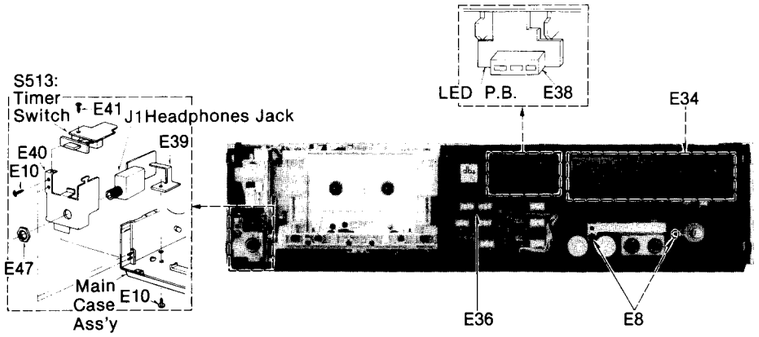
# ELECTRICAL PARTS LOCATION

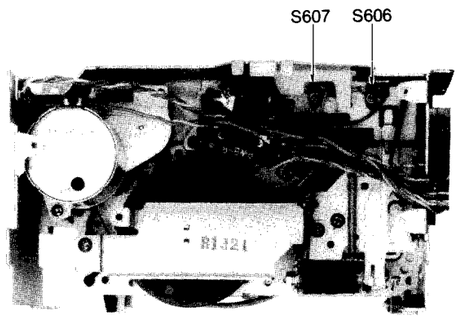


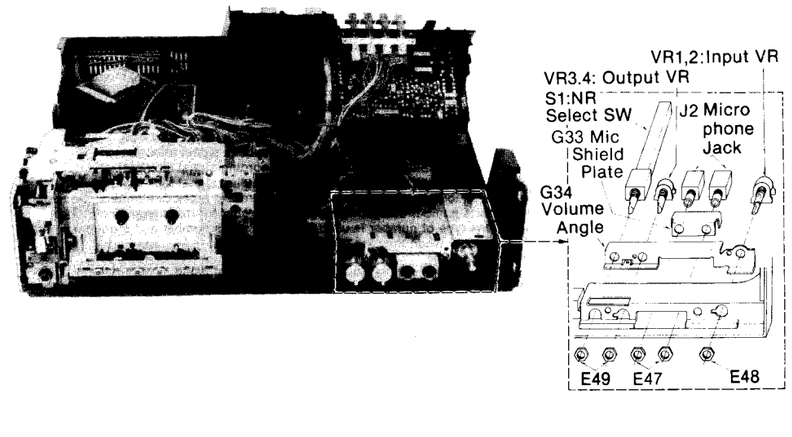



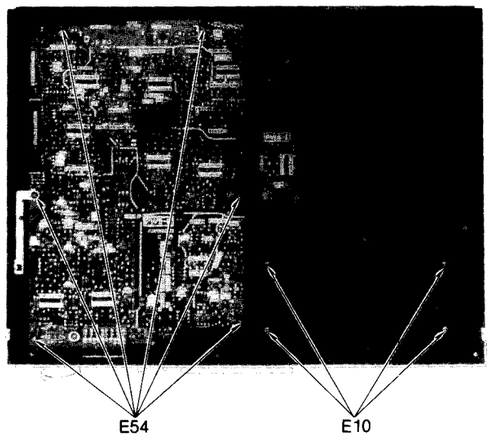



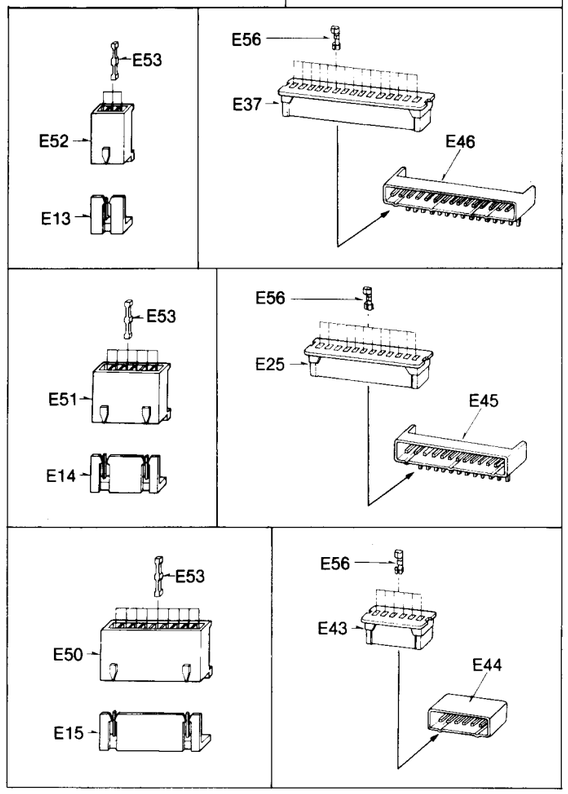




## REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| | **ELECTRICAL PARTS** | |
| E 1 | QWY4123Z | Record/Playback Head |
| E 2 | QWY2138Z | Erase Head |
| E 3 [D] ⚠ | SJA88 | AC Power Cord |
| [For all European areas except United Kingdom.] | | |
| [B] ⚠ | QFC1205 | AC Power Cord |
| [For United Kingdom.] | | |
| E 4 | QTD1164 | Cord Bushing |
| E 5 | QMA4402 | dbx P.B. Holder |
| E 6 | XTN3+16B | Tapping Screw |
| E 7 | XTN3+10B | Tapping Screw |
| E 8 | XTN3+8B | Tapping Screw |
| E 9 | XTS3+12B | Tapping Screw |
| E 10 | XTB3+10BFN | Tapping Screw |
| E 11 | QTD1181 | Wire Clamper |
| E 12 | QEJ5003S | Jack Board |
| E 13 | QJP1921TN | 3 Pin Post |
| E 14 | QJP1922TN | 6 Pin Post |
| E 15 | QJP1923TN | 9 Pin Post |
| E 16 | QJP1924TN | 12 Pin Post |
| E 17 | QJS1924TNL | 12 Pin Socket |
| E 18 ⚠ | QCR0011 | Spark Killer |
| E 19 | SJT777 | Pin Terminal |
| E 20 | XTN3+8B | Tapping Screw |
| E 21 | QMA4364 | Switch Angle |
| E 22 | XSN3+8S | Screw |
| E 23 | XWA3B | Washer |
| E 24 ⚠ | QTF1054 | Fuse Holder |
| E 25 | QJS12001T | 12 Pin Socket |
| E 26 | XTN3+10B | Tapping Screw |
| E 27 | QJT0015 | Lug Terminal |
| E 28 | QTH1164 | Heat Sink |
| E 29 | XSN3+8S | Screw |
| E 30 | XWA3B | Washer |
| E 31 | XWE3 | Washer |
| E 32 | N024B | Insulator Plate |
| E 33 | N018E | Insulator Plate |
| E 34 | QSIFM004F | FL Meter |
| E 35 | QJT1067 | Check Pin |
| E 36 | QKJ0520 | Led Holder-A |
| E 37 | QJS15001T | 15 Pin Socket |
| E 38 | QKJ0521 | LED Holder-B |
| E 39 | QJC0050 | Earth Plate |
| E 40 | QMA4365 | Timer Angle |
| E 41 | XTN3+6B | Tapping Screw |
| E 42 | XAMQ44P300 | Pilot Lamp |
| E 43 | QJS06001T | 6 Pin Socket |
| E 44 | QJP06S001T | 6 Pin Post |
| E 45 | QJP12L001T | 12 Pin Post (L-type) |
| E 46 | QJP15L001T | 15P Post (L-type) |
| E 47 | QNQ1070 | Nut |
| E 48 | QNQ1039 | Nut |
| E 49 | QNQ1004 | Nut |
| E 50 | QJS1923TN | 9 Pin Socket |
| E 51 | QJS1922TN | 6 Pin Socket |
| E 52 | QJS1921TN | 3 Pin Socket |
| E 53 | QJT1054 | Contact |
| E 54 | XTN3+10BFN | Tapping Screw |
| E 55 | QJi1466RR | Leaf Switch Circuit Board |
| E 56 | QJT1089 | Contact |

ST

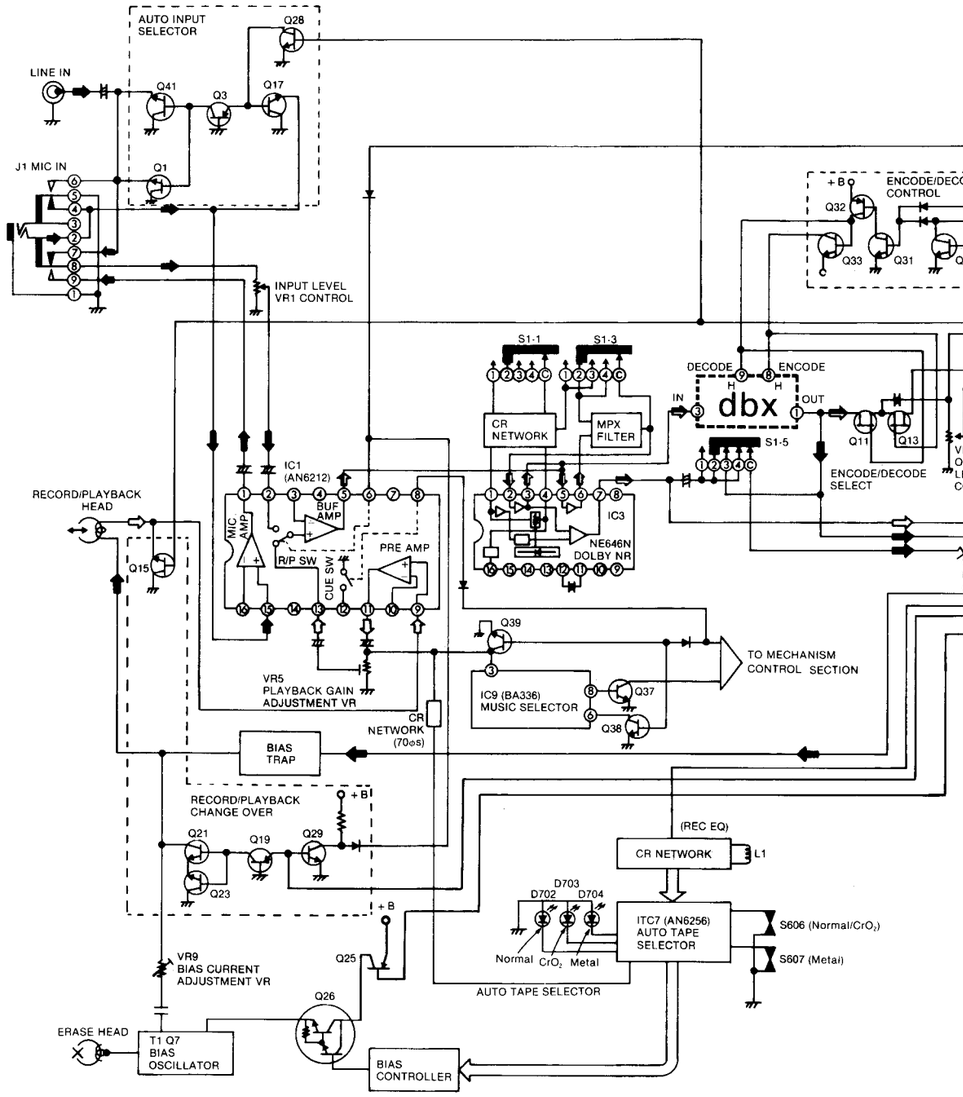
have special

ponents, use

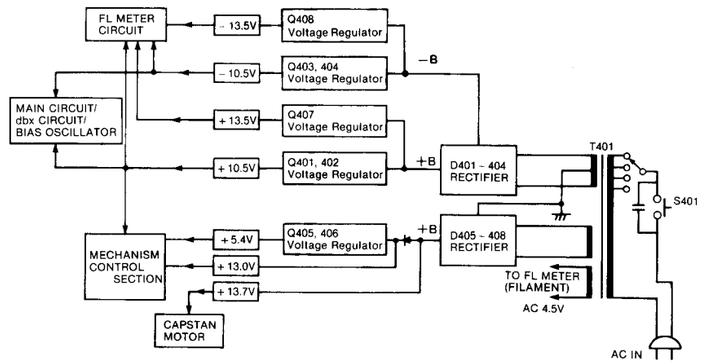
| Part Name & Description |
|---|
| **L PARTS** |
| Record/Playback Head |
| Erase Head |
| AC Power Cord |
| United Kingdom.] |
| AC Power Cord |
| Cord Bushing |
| dbx P.B. Holder |
| Tapping Screw |
| Tapping Screw |
| Tapping Screw |
| Tapping Screw |
| Tapping Screw |
| Wire Clamper |
| Jack Board |
| 3 Pin Post |
| 6 Pin Post |
| 9 Pin Post |
| 12 Pin Post |
| 12 Pin Socket |
| Spark Killer |
| Pin Terminal |
| Tapping Screw |
| Switch Angle |
| Screw |
| Washer |
| Fuse Holder |
| 12 Pin Socket |
| Tapping Screw |
| Lug Terminal |
| Heat Sink |
| Screw |
| Washer |
| Washer |
| Insulator Plate |
| Insulator Plate |
| FL Meter |
| Check Pin |
| Led Holder-A |
| 15 Pin Socket |
| LED Holder-B |
| Earth Plate |
| Timer Angle |
| Tapping Screw |
| Pilot Lamp |
| 6 Pin Socket |
| 6 Pin Post |
| 12 Pin Post (L-type) |
| 15P Post (L-type) |
| Nut |
| Nut |
| Nut |
| 9 Pin Socket |
| 6 Pin Socket |
| 3 Pin Socket |
| Contact |
| Tapping Screw |
| Leaf Switch Circuit Board |
| Contact |

# BLOCK DIAGRAM

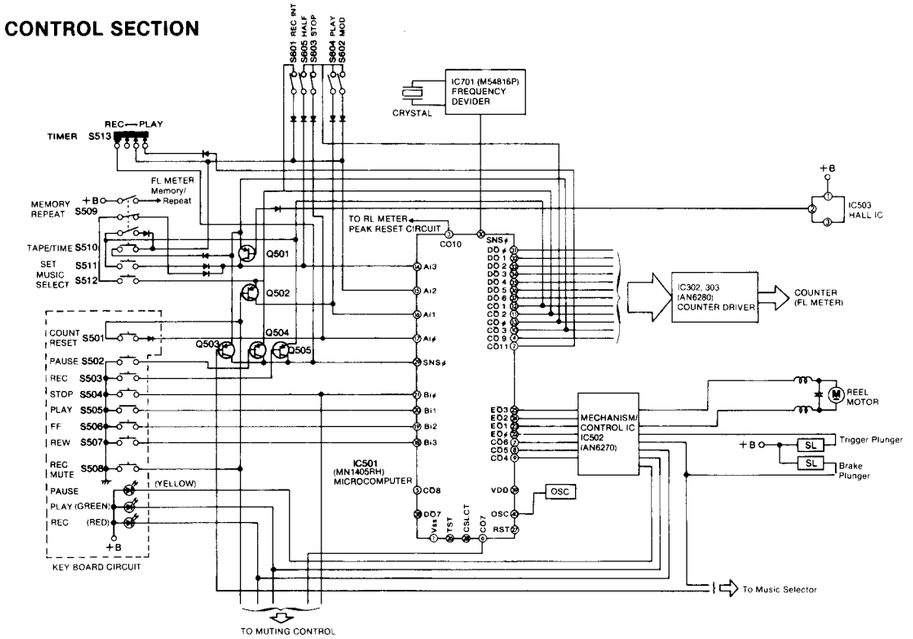
## • MAIN/FL METER SECTION




## • POWER SUPPLY SECTION

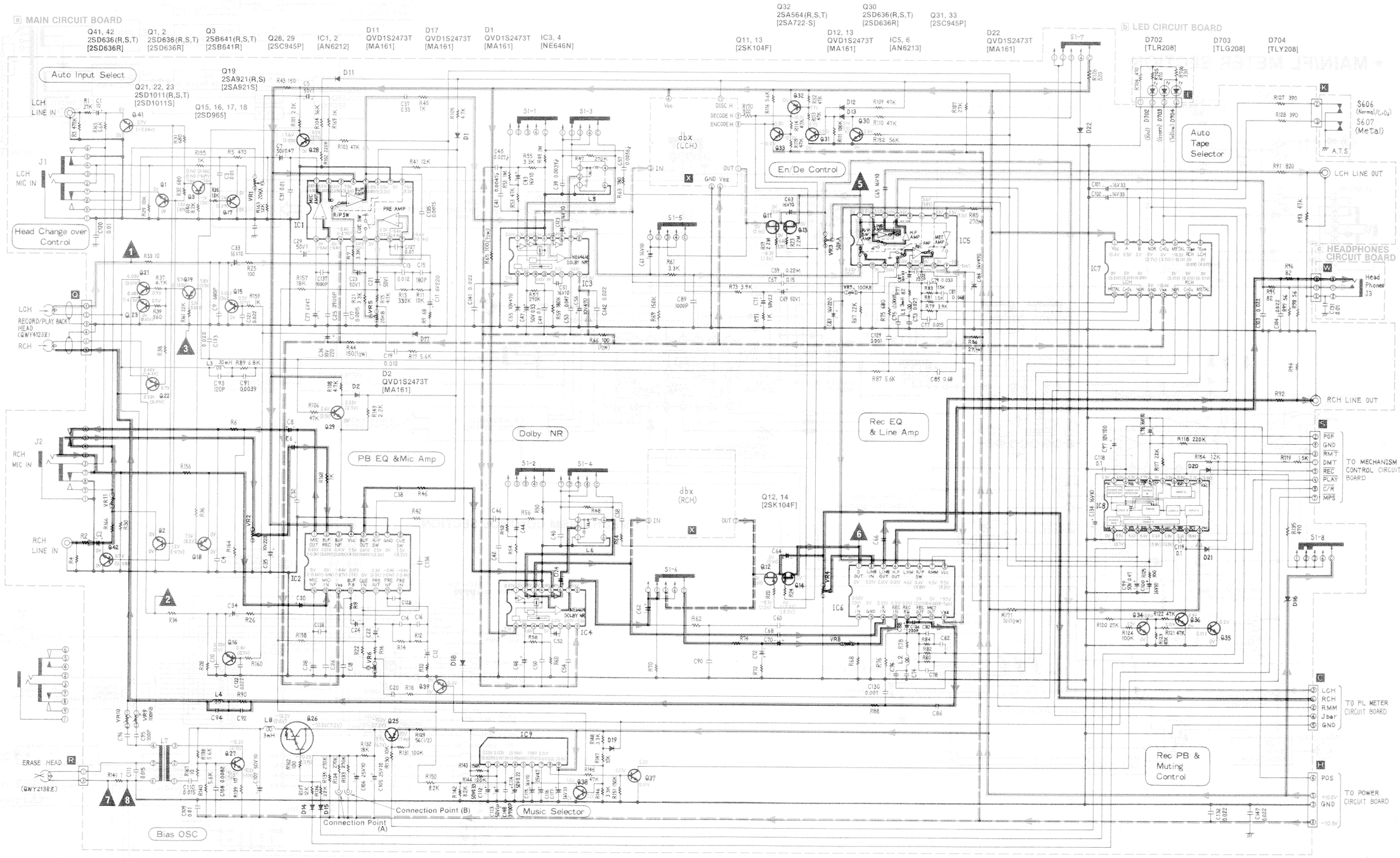



## • MECHANISM CONTROL SECTION

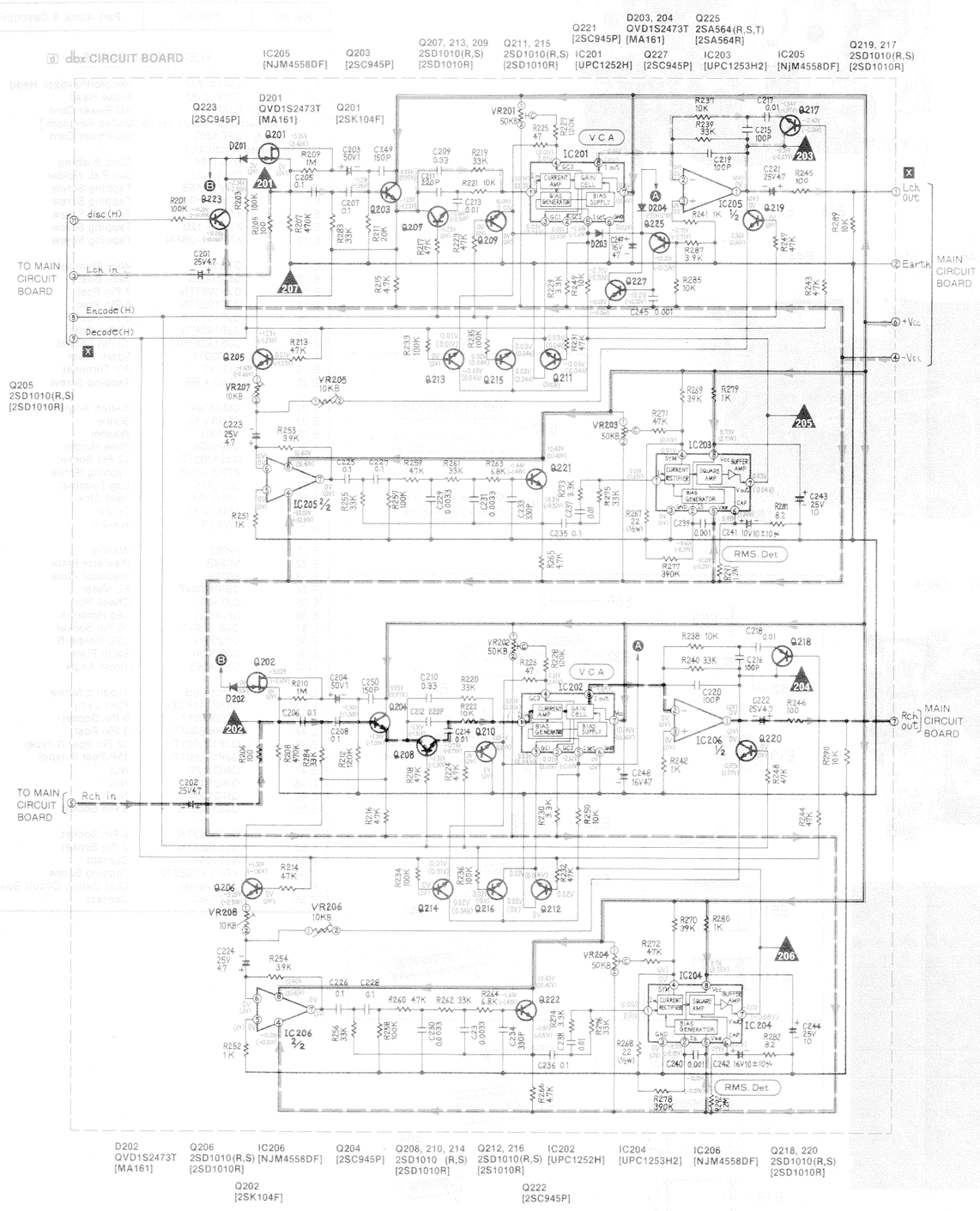


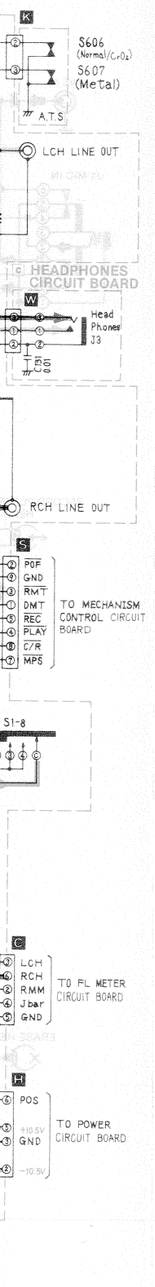
RS-M255X
RS-M255X

# SCHEMATIC DIAGRAM
## MAIN SECTION



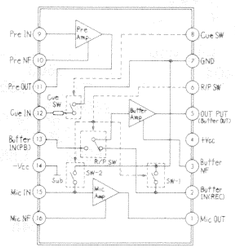
# dbx SECTION




# EQUIVALENT CIRCUITS

**IC1,2 AN6212**



■ **Truth table of IC1, 2** (Postive)

R / P SW

| ⑥pin | Operation |
|---|---|
| H | REC |
| L | PB |

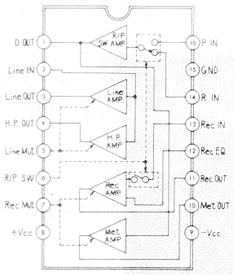
SW-1, SW-2

| ⑥pin | Operation |
|---|---|
| H | —— |
| L | Mute |

Cue SW

| ⑧pin | Operation |
|---|---|
| H | —— |
| L | Cue |

**IC5,6 AN6213**



■ **Truth table of IC5, 6 (Positive)**

R / P SW

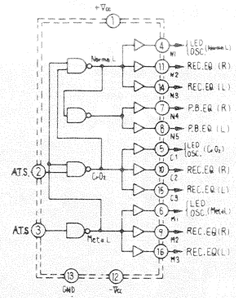
| ⑥pin | Operation |
|---|---|
| H | REC |
| L | PB |

Muting

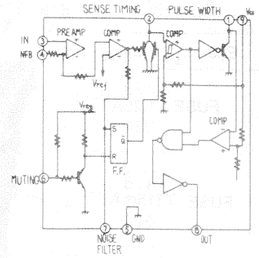
| ⑤, ⑦Pin | Operation |
|---|---|
| H | Muting OFF |
| L | Muting ON |

L : GND Level

**IC7 AN6256**



**IC9 BA336**



**NOTES:**
- S1-1 ~ S1-8 ..... NR select switch (shown in OUT position: (1) Dolby NR, (2) OUT, (3) dbx tape, (4) dbx disc)
- S606 ..... Auto tape select switch (For Normal/$CrO_2$ tape)
- S607 ..... Auto tape select switch (For Metal tape)

| Mode | S606 | S607 |
|---|---|---|
| Normal | on | on |
| $CrO_2$ | on | off |
| Metal | off | off |

- VR1, 2. ..... Input level controls.
- VR3, 4. ..... Output level control.
- VR5, 6. ..... Playback gain adjustment VR.
- VR7, 8. ..... Recording gain adjustment VR.
- VR9, 10. ..... Bias current adjustment VR.
- VR201, 202. ..... VCA symmetry adjustment VR.
- VR203, 204. ..... RMS detector adjustment VR.
- VR205, 206. ..... dbx standard level adjustment VR (Encode).
- VR207, 208. ..... dbx standard level adjustment VR (Decode).
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000 (Ω), 1M = 1,000 k (Ω)
- Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.
- The mark (▼) shows test point. e.g. ▽ = test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified
  - ○ Voltage values shown in MAIN SECTION.
    - NO MARK. . . . Voltage values at out (NR select switch) mode
    - ( ) ..... Voltage values at record mode.
    - [ ] ..... Voltage values at disc (NR select switch) mode
  - ○ Voltage values shown in dbx SECTION.
    - ( ) ..... Voltage values at out (NR select switch) mode.
    - [ ] ..... Voltage values at disc (NR select switch) mode. For measurement use VTVM.
- (⟹) indicates B + (bias).
- (⟸) indicates B − (bias).
- (⟹) indicates the flow of the playback signal (dbx out).
- (⟹) indicates the flow of the playback signal (dbx tape).
- (⟹) indicates the flow of the recording signal (dbx out).
- (⟸) indicates the flow of the recording signal (dbx tape).
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes. One type of number is used for supply parts number and production parts number when they are identical.
  - e.g. Q1
    - 2SC1844 (E, F) ◀—Production parts number
    - [2SC1844E] ◀—Supply parts number
    - D212
    - 1S2473T77 ◀—Production parts number.
    - [MA161] ◀—Supply parts numbers
- The supply parts number is described alone in the replacement parts list.
- **This schematic diagram may be modified at any time with the development of new technology.**

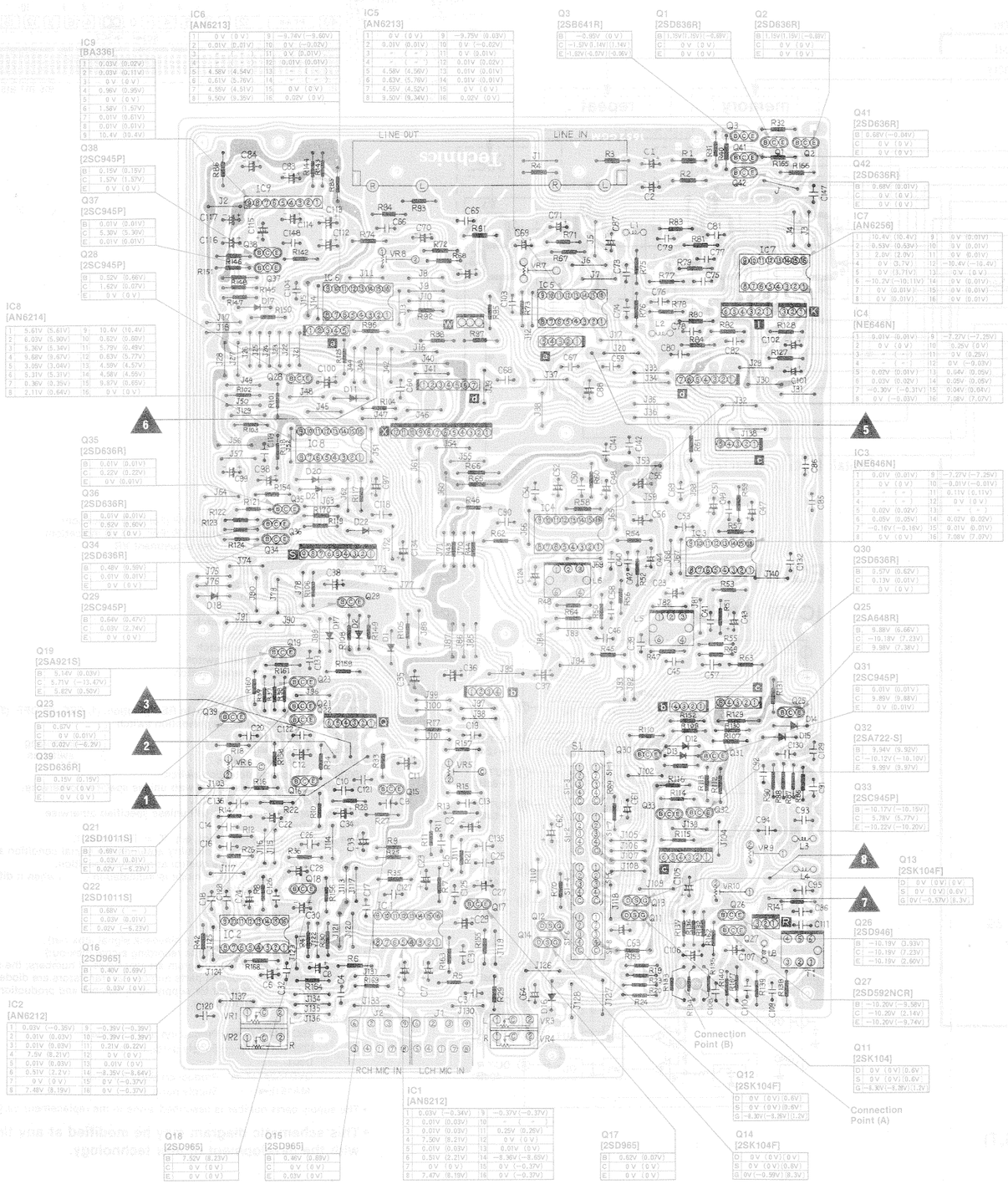
## SPECIFICATIONS

* Input level controls ··· MAX
* Output level control ··· MAX

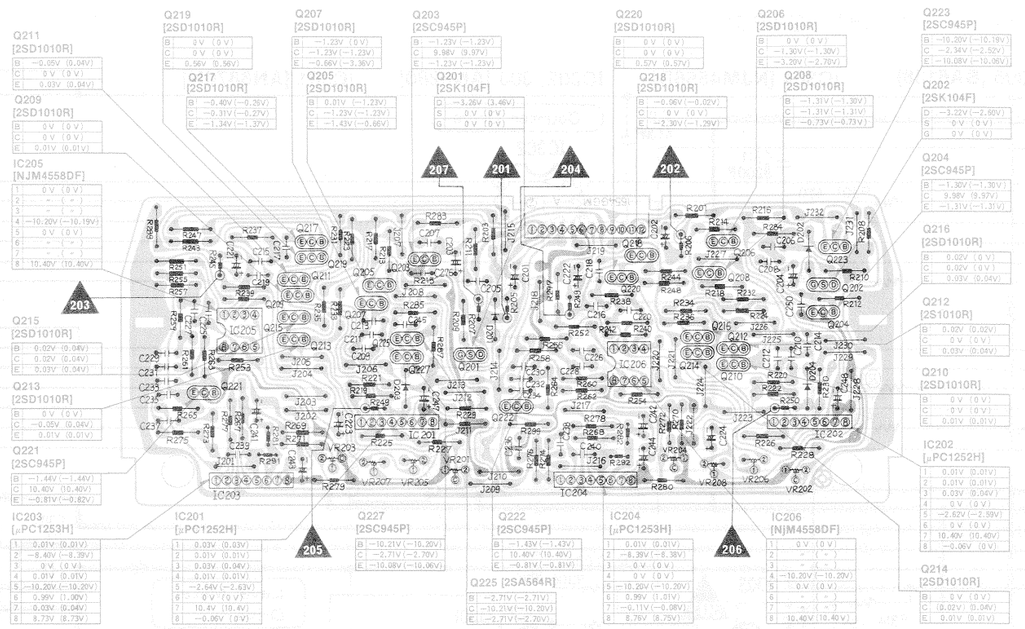
| | |
|---|---|
| Playback S/N ratio<br>* Test tape ··· QZZCFM | Greater than 45 dB |
| Overall distortion<br>* Test tape<br>··· QZZCRA for Normal<br>··· QZZCRX for $CrO_2$<br>··· QZZCRZ for Metal | Less than 4 % |
| Overall S/N ratio<br>* Test tape ··· QZZCRA | Greater than 43 dB<br>(without NAB filter) |

# CIRCUIT BOARDS

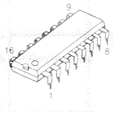
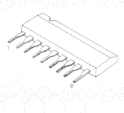
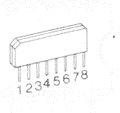
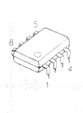
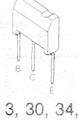
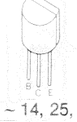
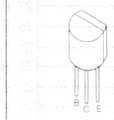
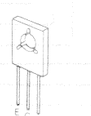
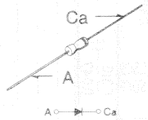
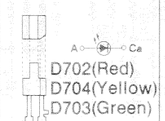
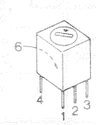
## a MAIN CIRCUIT BOARD




## d dbx CIRCUIT BOARD

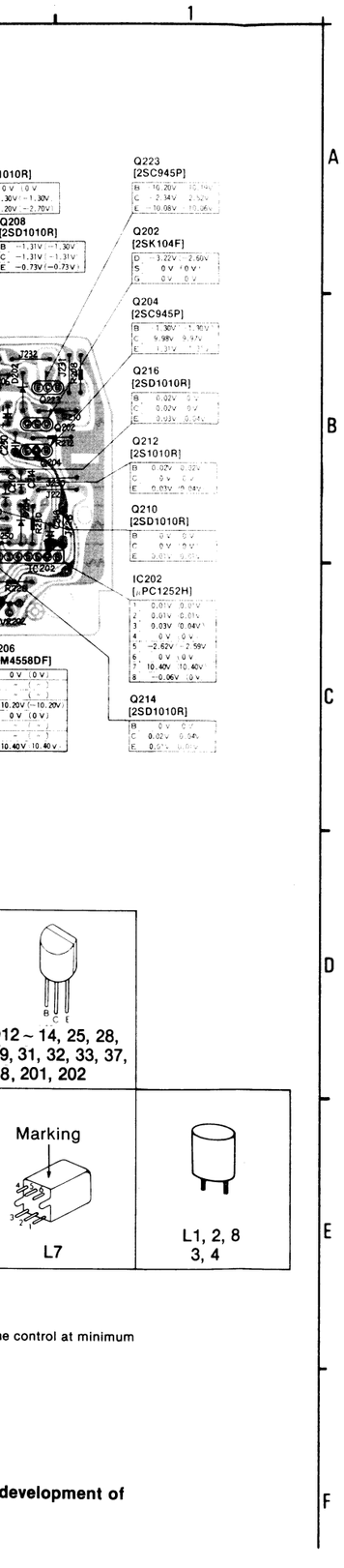



## TERMINATIONS

| | | | | | |
|---|---|---|---|---|---|
|  IC1 ~ 8 |  IC9 |  IC201 ~ 204 |  IC205, 206 |  Q1 ~ 3, 30, 34, 35, 36, 39, 41, 42, 203, 204, 221 ~ 223, 227 |  Q12 ~ 14, 25, 28, 29, 31, 32, 33, 37, 38, 201, 202 |
|  Q15 ~ 19, 21 ~ 23, 27, 205 ~ 220, 225 |  Q26 |  D1, 2, 11 ~ 22, 201 ~ 204 |  D702(Red) D704(Yellow) D703(Green) |  L5, 6 |  L7 |
| | | | | |  L1, 2, 8 3, 4 |

NOTES:
- The circuit shown in ▒▒ on the conductor is B + (bias) circuit.
- The circuit shown in ▒▒ on the conductor is B − (bias) circuit.
- Values indicated in [ ] are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  - ○ Voltage values shown in MAIN CIRCUIT BOARD
    NO MARK. . . Voltage values at Out (NR select switch) mode
    ( ) . . . . . Voltage values at record mode
    [ ] . . . . . Voltage values at disc (NR select switch) mode
  - ○ Voltage values shown in dbx CIRCUIT BOARD
    NO MARK. . . Voltage values at dbx tape (NR select switch) mode
    ( ) . . . . . Voltage values at Out (NR select switch) mode.
    For measurement use VTVM.

**• This circuit board diagram may be modified at any time with the development of new technology.**




**NOTES: RESISTORS**

ERD. . . Carbon
ERG. . . Metal-oxide
ERS. . . Metal-oxide
ERO. . . Metal-film
ERX. . . Metal-film
ERQ. . . Fuse type metallic
ERC. . . Solid
ERF. . . Cement

**CAPACITORS**

ECBA. . . . Ceramic
ECG . . . Ceramic
ECK . . . Ceramic
ECC . . . Ceramic
ECF . . . . Ceramic
ECQM. . . . Polyester film
ECQE. . . . Polyester film
ECQF. . . . Polypropylene

ECE . . . . Electrolytic
ECE N. . . Non polar electrolytic
ECQS. . . . . Polystyrene
ECS . . . . Tantalum
QCS. . . . . Tantalum

## REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

### RESISTORS

| Ref No. | Part No. |
|---|---|
| R 1, 2 | ERD25TJ273 |
| R 3, 4 | ERD25TJ474 |
| R 5, 6 | ERD25FJ471 |
| R 7, 8 | ERD25FJ332 |
| R 9, 10 | ERD25FJ680 |
| R 11, 12 | ERD25FJ103 |
| R 13, 14 | ERD25TJ334 |
| R 15, 16 | ERD25FJ472 |
| R 17, 18 | ERD25FJ562 |
| R 19, 20 | ERD25TJ225 |
| R 21, 22 | ERD25FJ332 |
| R 23, 24 | ERD25TJ225 |
| R 25, 26 | ERD25FJ101 |
| R 29, 30 | ERD25FJ103 |
| R 31, 32 | ERD25FJ681 |
| R 33, 34 | ERD25FJ100 |
| R 35, 36 | ERD25FJ182 |
| R 37, 38 | ERD25FJ472 |
| R 39 | ERD25FJ561 |
| R 40 | ERD25FJ822 |
| R 41, 42 | ERD25TJ123 |
| R 43, 44 | ERD50FJ151 |
| R 45, 46 | ERD25FJ102 |
| R 47, 48 | ERD25TJ274 |
| R 49, 50, 51, 52 | ERD25TJ105 |
| R 53, 54 | ERD25TJ473 |
| R 55, 56 | ERD25FJ332 |
| R 57, 58 | ERD25TJ274 |
| R 59, 60 | ERD25TJ184 |
| R 61, 62 | ERD25FJ332 |
| R 63, 64 | ERD25FJ181 |
| R 65, 66 | ERD50FJ101 |
| R 67, 68 | ERD25TJ223 |
| R 69, 70 | ERD25TJ154 |
| R 71, 72 | ERD25FJ102 |
| R 73, 74 | ERD25FJ392 |
| R 75, 76 | ERD25FJ681 |
| R 77, 78 | ERD25FJ820 |
| R 79, 80 | ERD25FJ392 |
| R 81, 82, 83, 84 | ERD25FJ152 |
| R 85, 86 | ERQ12HJ270 |
| R 87, 88 | ERD25FJ562 |
| R 89, 90 | ERD25FJ682 |
| R 91, 92 | ERD25FJ821 |
| R 93, 94 | ERD25TJ473 |
| R 95, 96 | ERD25FJ820 |
| R 97, 98 | ERD25FJ560 |
| R 101 | ERD25FJ222 |
| R 102 | ERD25TJ224 |
| R 103 | ERD25TJ473 |
| R 104 | ERD25TJ563 |
| R 105 | ERD25FJ472 |
| R 106 | ERD25TJ473 |
| R 107 | ERD25TJ273 |
| R 108 | ERD25FJ472 |
| R 109, 110 | ERD25TJ473 |
| R 111 | ERD25TJ104 |
| R 112, 113, 114, 115 | ERD25TJ473 |
| R 116 | ERD25FJ562 |
| R 117 | ERD25TJ223 |
| R 118 | ERD25TJ224 |
| R 119 | ERD25FJ152 |
| R 120 | ERD25TJ273 |
| R 121, 122, 123 | ERD25TJ473 |
| R 124 | ERD25TJ104 |
| R 125 | ERD25FJ101 |
| R 126 | ERD25FJ821 |
| R 127, 128 | ERD25FJ391 |
| R 129 | ERD50FJ560 |
| R 130 | ERD25FJ103 |
| R 131 | ERD25TJ104 |
| R 132 | ERD25TJ183 |
| R 133, 134, 135 | ERD25TJ274 |
| R 136 | ERD25TJ223 |
| R 137 | ERD25TJ123 |
| R 138 | ERD25FJ562 |
| R 139 | ERD25FJ100 |
| R 140 | ERD25FJ562 |
| R 141 | ERD25FJ1R0 |
| R 142 | ERD25FJ822 |
| R 143 | ERD25TJ154 |
| R 144 | ERD25TJ124 |
| R 145 | ERD25TJ473 |
| R 146 | ERD25FJ332 |
| R 147 | ERD25FJ103 |
| R 148 | ERD25FJ332 |
| R 149 | ERD25FJ222 |
| R 150 | ERD25FJ822 |
| R 151 | ERD25TJ154 |
| R 152 | ERD25TJ563 |
| R 153 | ERD25FJ471 |
| R 154 | ERD25FJ122 |
| R 155, 156 | ERD25FJ102 |
| R 157, 158 | ERD25TJ183 |
| R 159, 160 | ERD25FJ102 |
| R 161 | ERD25TJ223 |
| R 162 | ERD25FJ101 |
| R 163, 164 | ERD25TJ123 |
| R 165, 166 | ERD25FJ562 |
| R 167 | ERD25FJ100 |
| R 168, 169 | ERD25FJ102 |
| R 170 | ERD25FJ821 |
| R 171 | ERQ12HJ100 |
| R 201, 203 | ERD25TJ104 |
| R 205, 206 | ERD25FJ101 |
| R 207 | ERD25FJ474 |
| R 208 | ERD25TJ474 |
| R 209, 210 | ERD25TJ105 |
| R 211, 212 | ERD25TJ124 |
| R 213, 214 | ERD25TJ473 |
| R 215, 216 | ERD25FJ472 |
| R 217, 218 | ERD25TJ473 |
| R 219, 220 | ERD25TJ333 |
| R 221, 222 | ERD25FJ103 |
| R 223, 224 | ERD25TJ473 |
| R 225, 226 | ERD25FJ470 |
| R 227, 228 | ERD25TJ124 |
| R 229, 230 | ERD25FJ332 |
| R 231, 232 | ERD25TJ473 |
| R 233, 234, 235, 236 | ERD25TJ104 |
| R 237, 238 | ERD25FJ103 |
| R 239, 240 | ERD25TJ333 |
| R 241 | ERD25FJ102 |
| R 242 | ERD25FJ102 |
| R 243, 244 | ERD25TJ473 |
| R 245, 246 | ERD25FJ101 |
| R 247, 248 | ERD25TJ473 |
| R 249, 250 | ERD25FJ103 |
| R 251, 252 | ERD25FJ102 |
| R 253, 254 | ERD25FJ392 |
| R 255, 256 | ERD25TJ333 |
| R 257, 258 | ERD25TJ104 |
| R 259, 260 | ERD25FJ472 |
| R 261, 262 | ERD25TJ333 |
| R 263, 264 | ERD25FJ682 |
| R 265, 266 | ERD25FJ472 |
| R 267, 268 | ERQ12HJ220 |
| R 269, 270 | ERD25TJ393 |
| R 271, 272 | ERD25TJ473 |
| R 273, 274 | ERD25FJ332 |
| R 275, 276 | ERD25TJ333 |
| R 277, 278 | ERD25TJ394 |
| R 279, 280 | ERD25FJ102 |
| R 281, 282 | ERD25FJ8R2 |
| R 283, 284 | ERD25TJ333 |
| R 285 | ERD25FJ103 |
| R 287 | ERD25FJ392 |
| R 289, 290 | ERD25FJ103 |
| R 291, 292 | ERD25TJ125 |
| R 301, 302, 303, 304 | ERD25FJ471 |
| R 306, 307 | ERD25TJ473 |
| R 309 | ERD25TJ223 |
| R 310 | ERD25TJ104 |
| R 311 | ERD25TJ473 |
| R 312 | ERD25FJ183 |
| R 314 | ERD25FJ182 |
| R 315 | ERD25FJ102 |
| R 316 | ERD25FJ103 |
| R 318 | ERD25FJ472 |
| R 320 | ERD25TJ154 |
| R 321, 322 | ERD25TJ683 |
| R 323, 324 | ERD25TJ563 |
| R 325, 326 | ERD25TJ224 |
| R 327, 328 | ERD25FJ222 |
| R 330 | ERD25FJ562 |
| R 332 | ERD25TJ473 |
| R 333 | ERD25TJ104 |
| R 334 | ERD25TJ224 |
| R 335 | ERD25TJ473 |
| R 336 | ERD25FJ332 |
| R 339, 340 | ERD25FJ562 |
| R 401 ⚠ | ERD25FJ102 |
| R 402 ⚠ | ERQ12HJ2R7P |
| R 403 ⚠ | ERD25FJ102 |
| R 404 | ERD25FJ471 |
| R 405 | ERD25FJ391 |
| R 406 | ERD25FJ332 |
| R 407 | ERD25FJ472 |
| R 408 | ERD25FJ103 |
| R 409 ⚠ | ERD25FJ102 |
| R 410 ⚠ | ERQ12HJ2R7P |
| R 411 ⚠ | ERD25FJ102 |
| R 412 | ERD25FJ103 |
| R 413 | ERD25TJ823 |
| R 414 ⚠ | ERX2ANJ5R6 |
| R 415 ⚠ | ERD25FJ102 |
| R 416 | ERD25FJ103 |
| R 417 ⚠ | ERD25FJ821 |
| R 418 | ERD50FJ331 |
| R 419 | ERD25FJ121 |
| R 420 | ERD50FJ331 |
| R 421 | ERD25TJ104 |
| R 422 | ERD25TJ223 |
| R 423 | ERD25TJ123 |
| R 424 | ERD25FJ560 |
| R 425, 426 | ERD50FJ271 |
| R 428 | ERD25FJ392 |
| R 429 | ERD25FJ562 |
| R 430 | ERD25TJ683 |
| R 701 | ERD25FJ222 |
| R 702 | ERD25FJ221 |
| R 703 | ERD25FJ331 |
| R 704, 705 | ERD25FJ471 |
| R 706 | ERD25FJ331 |

### VARIABLE RESISTORS

| | |
|---|---|
| VR 1, 2 | EWJ5SAF22A24 |
| VR 3, 4 | QWKGTA024A54 |
| VR 5, 6 | EVNM4AA00B24 |
| VR 7, 8, 9, 10 | EVNM4AA00B15 |
| VR 201, 202, 203, 204 | EVNM0AA00B54 |
| VR 205, 206, 207, 208 | EVNM0AA00B14 |
| VR 301 | EVNM4AA00B24 |
| VR 302 | EVNM4AA00B53 |
| VR 501 | EVNK4AA00B14 |

### CAPACITORS

| | |
|---|---|
| C 1, 2 | ECEA1HS100 |
| C 3, 4 | ECFDD103KXY |
| C 5, 6 | ECEA50Z1 |
| C 7, 8 | ECEA50ZR47 |
| C 9, 10 | ECKD1H681KB |
| C 11, 12 | ECEA1AS221 |
| C 13, 14 | ECQM1H123JZ |
| C 15, 16 | ECCD1H181K |
| C 17, 18 | ECQM1H152JZ |
| C 19, 20 | ECQM1H123JZ |
| C 21, 22, 23, 24 | ECESA50Z1 |
| C 25, 26 | ECKD1H392KB |
| C 27, 28 | ECEA1AS470 |
| C 29, 30 | ECEA50M1R |
| C 31, 32 | ECKD1H103ZF |
| C 33, 34 | ECEA16M10R |
| C 35, 36 | ECEA1AS221 |
| C 37, 38 | ECQV05334JZ |
| C 39, 40 | ECQM1H392JZ |
| C 41, 42 | ECQM1H472JZ |
| C 43, 44 | ECEA1HS100 |
| C 45, 46 | ECQM1H273JZ |
| C 47, 48 | ECEA1HSR33 |
| C 49, 50 | ECQM1H104JZ |
| C 51, 51 | ECEA1HS100 |
| C 53, 54 | ECFDD473KXY |
| C 55, 56 | ECEA1AS471 |
| C 57, 58 | ECQM1H562JZ |
| C 59, 60 | ECQV05224JZ |
| C 61, 62, 63, 64 | ECEA1HS100 |
| C 65, 66 | ECEA1EN3R3 |
| C 67, 68 | ECQV05154JZ |
| C 69, 70 | ECESA50Z1 |
| C 71, 72 | ECEA50Z2R2 |
| C 73, 74 | ECQM1H273JZ |
| C 75, 76 | ECQM1H682JZ |
| C 77, 78 | ECQM1H153JZ |
| C 79, 80 | ECQM1H333JZ |
| C 81, 82 | ECQM1H683JZ |
| C 83 | ECEA1CS221 |
| C 84 | ECEA1CS471 |
| C 85, 86 | ECQV0568JZ |
| C 87, 88 | ECEA1ES220 |
| C 89, 90 | ECKD1H102KB |
| C 91, 92 | ECQM1H392JZ |
| C 93, 94 | ECKD2H121K |
| C 95, 96 | ECCD1H101KC |
| C 97 | ECEA1AS101 |
| C 98 | ECEA1HS100 |
| C 99 | ECEA50ZR47 |
| C 100 | ECEA1HS100 |
| C 101, 102 | ECEA1CS330 |
| C 103, 104 | ECFDD223KXY |
| C 105, 106 | ECEA1HS100 |
| C 107 | ECEA1HF100 |
| C 108 | ECQM1H822KZ |
| C 109 | ECKD1H103ZF |
| C 110 | ECFDD153KXY |
| C 111 | ECQP1H153JZ |
| C 112 | ECEA1HSR33 |
| C 113 | ECESA50Z1 |
| C 114 | ECEA50ZR22 |
| C 115 | ECEA1HS100 |
| C 116 | ECEA25Z4R7 |
| C 117 | ECEA1CS330 |
| C 118, 119 | ECQM1H104JZ |
| C 120 | ECKD1H103ZF |
| C 131 | ECKD1H103ZF |
| C 121, 122 | ECKD1H223ZF |
| C 123, 124 | ECEA1HS100 |
| C 125, 126 | ECCD1H221K |
| C 127, 128 | ECKD1H103ZF |
| C 129, 130 | ECKD1H102KB |
| C 132, 133 | ECKD1H223ZF |
| C 135, 136 | ECQM1H152JZ |
| C 141, 142, 147 | ECKD1H223ZF |
| C 148 | ECKD1H392KB |
| C 201, 202 | ECEA25Z4R7 |
| C 203, 204 | ECEA50Z1 |
| C 205, 206, 207, 208 | ECQV05104JZ |
| C 209, 210 | ECQV05334JZ |
| C 212 | ECCD1H221K |
| C 213, 214 | ECQM1H103JZ |
| C 215 | ECCD1H103JZ |
| C 216 | ECCD1H101KC |
| C 217, 218 | ECQM1H103JZ |
| C 219, 220 | ECCD1H101KC |
| C 221 | ECEA25Z4R7 |
| C 221 | ECCD1H221K |
| C 222, 223, 224 | ECEA25Z4R7 |
| C 225, 226, 227, 228 | ECQV05104JZ |
| C 229, 230, 231, 232 | ECQM1H332JZ |
| C 233, 234 | ECCD1H331K |
| C 235, 236 | ECQV05104JZ |
| C 237, 238 | ECQM1H103JZ |
| C 239, 240 | ECQM1H102JZ |
| C 241, 242 | ECEA16M10R |
| C 243, 244 | ECEA1HS100 |
| C 245 | ECQM1H102JZ |
| C 247, 248 | ECEA1ES470 |
| C 249, 250 | ECCD1H151KC |
| C 301 | ECFD104KXY |
| C 302 | ECFDD223KXY |
| C 303, 304 | ECEA50Z1 |
| C 305, 306 | ECEA50ZR47 |
| C 307, 308 | ECEA1HS100 |
| C 309 | ECEA1ES101 |
| C 310 | ECFDD473KXY |
| C 311 | ECKD1H682MD |
| C 401 ⚠ | ECEA1ES332 |
| C 402 ⚠ | ECEA1ES101 |
| C 403 | ECKD1H103ZF |
| C 404 | ECEA1ES220 |
| C 405 | ECEA1CS331 |
| C 406 | ECKD1H103ZF |
| C 407 ⚠ | ECEA1ES222 |
| C 408 ⚠ | ECEA1ES101 |
| C 409 | ECKD1H103ZF |
| C 410 | ECEA50Z1 |
| C 411 | ECEA1CS331 |
| C 412 | ECKD1H103ZF |
| C 413 | ECQP1103JZ |
| C 414 ⚠ | ECEA1CS471 |
| C 415, 416 ⚠ | ECEA1CS472 |
| C 417, 418 ⚠ | ECEA1HS100 |
| C 419 | ECKD1H103ZF |
| C 420 | ECQP1103JZ |
| C 421 | ECEA1ES470 |
| C 422 | ECEA1ES220 |
| C 423 | ECEA1ES470 |
| C 424 | ECEA1ES220 |
| C 425, 426 | ECFDD104KZY |
| C 427 | ECEA50Z3R3 |
| C 428, 430 | ECFDD104KZY |
| C 431 ⚠ | ECEA1CS472 |
| C 502 | ECKD1H102MD |
| C 503 | ECCD1H331K |
| C 504 | ECEA1AS221 |
| C 505 | ECKD1H332ZF |
| C 506 | ECEA50ZR2R2 |
| C 507 | ECKD1H222MD |
| C 508 | ECEA1CN100 |
| C 511 | ECEA50ZR1 |
| C 702 | ECCD1H390KC |
| C 703 | ECCD1H101KC |
| C 704 | ECCD1H470KC |
| C 705 | ECKD1H102KB |

### COMBINATION PARTS

| | |
|---|---|
| Z 501 | EXBEQ5273K |
| Z 502 | EXBD86181K |
| Z 503 | EXBEQ4272K |
| Z 504 | QCRFWA1 |
| Z 505 | EXFP4472Z |
| Z 506 | EXBD8825K |
| Z 507 | EXRP152K473 |

### TRANSISTORS

| | |
|---|---|
| Q 1, 2 | 2SD636R |
| Q 3 | 2SB641R |
| Q 11, 12, 13, 14 | 2SK104F |
| Q 15, 16 | 2SD965 |
| Q 17, 18 | 2SD965 |
| Q 19 | 2SA921S |
| Q 21, 22, 23 | 2SD1011S |
| Q 25 | 2SA683R |
| Q 26 | 2SD946 |
| Q 27 | 2SD592NCR |
| Q 28, 29 | 2SC945P |
| Q 30 | 2SD636R |
| Q 31 | 2SC945P |
| Q 32 | 2SA722-S |
| Q 33 | 2SC945P |
| Q 34, 35, 36 | 2SD636R |
| Q 37, 38 | 2SC945P |
| Q 39, 41, 42 | 2SD636R |
| Q 201, 202 | 2SK104F |
| Q 203, 204 | 2SC945P |
| Q 205 | 2SD1010R |
| Q 206, 207, 208, 209, 210, 211, 212, 213, 214 215, 216, 217, 218, 219, 220 | 2SD1010R |
| Q 221, 222, 223 | 2SC945P |
| Q 225 | 2SA564R |
| Q 227 | 2SC945P |
| Q 301, 302 | 2SD636R |
| Q 303 | 2SB641R |
| Q 304 | 2SA564R |
| Q 401 | 2SD836Q |
| Q 402 | 2SC945P |
| Q 403 | 2SA564R |
| Q 404 | 2SB895R |
| Q 405 | 2SD946 |
| Q 406 | 2SC945P |
| Q 407 | 2SD592NCR |
| Q 408 | 2SA683R |
| Q 501, 502, 503, 504, 505 | 2SB643R |
| Q 506 | 2SD636R |
| Q 508 | 2SD965 |

### DIODES & RECTIFIERS

| | |
|---|---|
| D 1, 2, 11, 12, 13, 14, 15 | MA161 |
| D 16 | RVDRD6R2EB |
| D 17, 18, 19, 20, 21, 22, 201, 202, 203, 204, 301, 302, 303, 305, 306 | MA161 |
| D 401, 402, 403, 404, 405, 406, 407, 408, 409 | SM112 |
| D 410, 411 | MA1056 |
| D 412, 413 | MA161 |
| D 414, 415 | MA1150A |
| D 416 | MA1033LLF |
| D 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514 | MA161 |
| D 515 | LN41YPHL |
| D 516 | LN31GPHL |
| D 517 | LN21RPHL |
| D 702 | TLR208 |
| D 703 | TLG208 |
| D 704 | TLY208 |

### INTEGRATED CIRCUITS

| | |
|---|---|
| IC 1 | AN6212 |
| IC 2 | MA6212 |
| IC 3, 4 | NE646N |
| IC 5, 6 | AN6213 |
| IC 7 | AN6256 |
| IC 8 | AN6214 |
| IC 9 | BA336 |
| IC 201, 202 | UPC1252H |
| IC 203, 204 | UPC1253H2 |
| IC 205, 206 | NJM4558DF |
| IC 301 | AN6870N |
| IC 302, 303 | AN6280 |
| IC 304 | NJM4556D |
| IC 305 | BA6138 |
| IC 501 | MN1405RH |
| IC 502 | AN6270 |
| IC 503 | DN6838A |
| IC 701 | M54816P |

| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| **RESONATOR** | | |
| X 701 | QZE0049 | Crystal |
| **COILS** | | |
| L 1, 2 | QLQX0332KWA | Peaking Coil |
| L 3, 4 | QLQX0343KWA | Bias Trap Coil |
| L 5, 6 | QLM9Z9K | MPX Filter |
| L 7 | QLB0198KA | Bias Oscillation Coil |
| L 8 | QLQX0332KWA | Peaking Coil |
| L 501 | ELEH101KA | Choke Coil |
| L 502, 503 | QLQZ1014D | Choke Coil |
| **TRANSFORMER** | | |
| T 401 ⚠ | QLPD66EMX | AC Power Transformer |
| **FUSES** | | |
| F 1, 2 ⚠ | XBAQ0008 | Fuse (T630mA) |
| F 3 ⚠ | XBAQ125028 | Fuse (T1.25A) |
| F 4, 5 ⚠ | XBAQ0006 | Fuse (T315mA) |
| **SWITCHES** | | |
| S 1 | QSR8402 | Rotary Switch (NR Selector) |
| S 401 ⚠ | QSW1117AS | Push Switch (Power ON/OFF) |
| S 402 ⚠ | QSR1407 | Rotary Switch (Voltage Selector) |
| S 501, 502, 503, 504, 505, 506, 507, 508 | QSW1118HA | Key Board Switch |
| S 509, 510, 511, 512 | QSWY409 | Push Switch |
| S 513 | QSS1303 | Slide Switch (Timer Switch) |
| S 601 | QSB0260 | Leaf Switch (Erase Safety Switch) |
| S 602 | QSB0260 | Leaf Switch (Mode Sensing Switch) |
| S 603 | QSB0261 | Leaf Switch (Stop Switch) |
| S 604 | QSB0260 | Leaf Switch (Playback Switch) |
| S 605 | QSB0261 | Leaf Switch (Half Detection Switch) |
| S 606, 607 | QSB0266 | Leaf Switch (Auto Tape Selector) |
| **JACKS** | | |
| J 1 | QJA0259 | Headphones Jack |
| J 2 | QJA0262 | Microphone Jack |

RS-M255X
RS-M255X

# SCHEMATIC DIAGRAM

## MECHANISM CONTROL SECTION

k TIMER CIRCUIT BOARD

Q501 ~ 505
2SB643(Q,R,S)
[2SB643R]

IC701
[M54816P]

h QUARTZ CIRCUIT BOARD

n MECHANISM CONTROL CIRCUIT BOARD

Q508
[2SD965]

i HALL IC CIRCUIT BOARD

IC503
[DN6838A]

j REEL MOTOR CIRCUIT BOARD

IC501
[Micro Computer]

IC502

l PUSH SWITCH CIRCUIT BOARD

m KEY BOARD CIRCUIT BOARD

D515 [LN41YPHL] D516 [LN31GPHL]
D517 [LN21RPHL]

D501 ~ 510, 511 ~ 514
QVD1S2473T
[MA161]

IC501
[MN1405RH]

Q506
[2SD636R]

IC502
[AN6270]

## FL METER SECTION

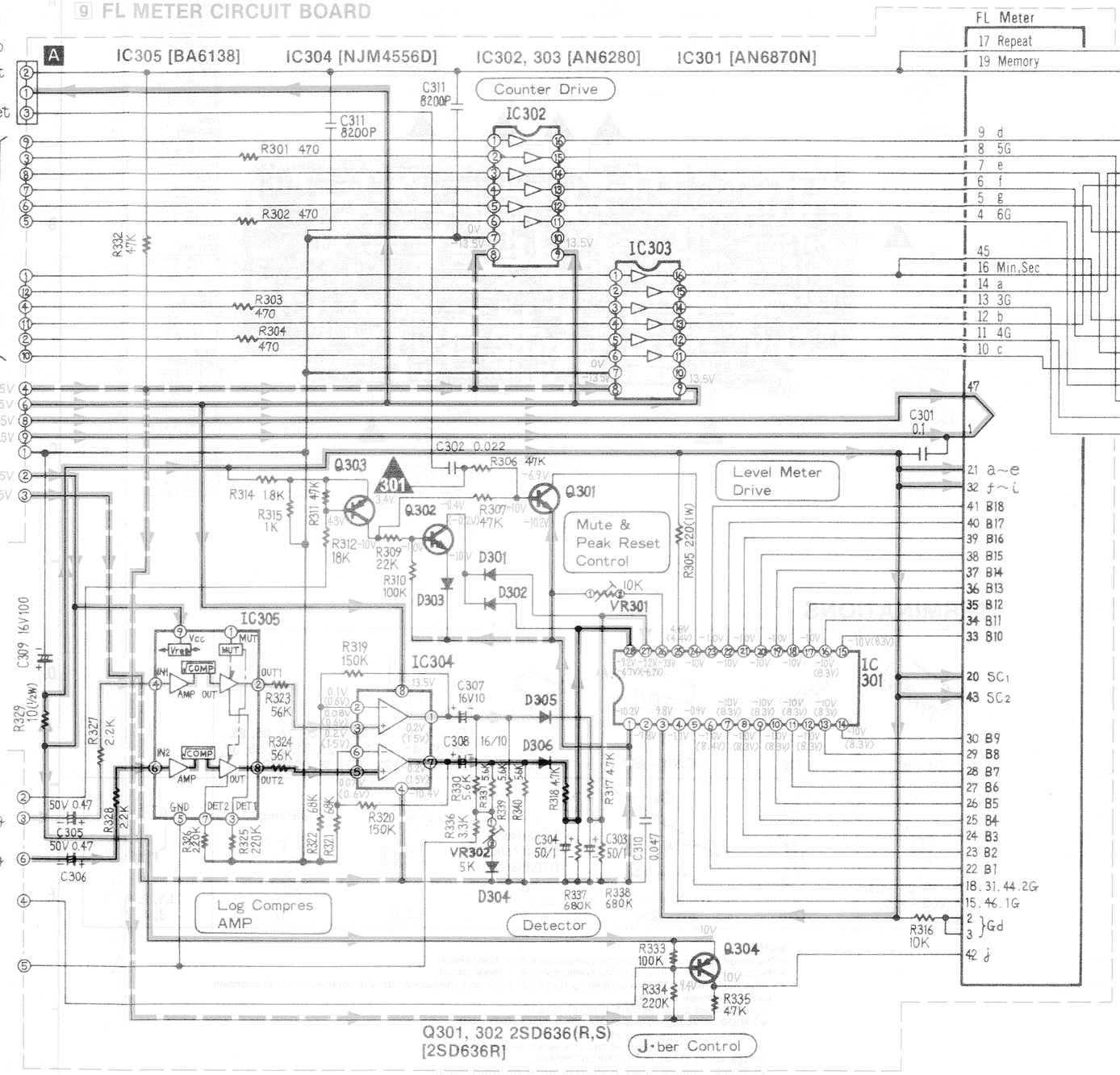
g FL METER CIRCUIT BOARD

IC305 [BA6138]

IC304

## ER SECTION

### g FL METER CIRCUIT BOARD




D301~303 QVD1S2473T [MA161]
305, 306

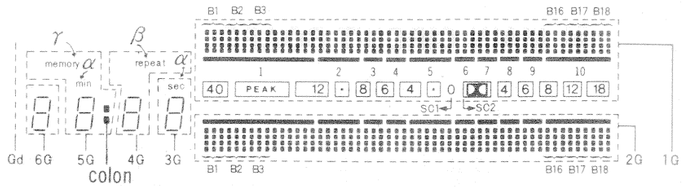
D304 1S2473FV [MA161]

Q303 2SB641(R,S) [2SB641R]

Q304 2SA564(R,S,T) [2SA564R]

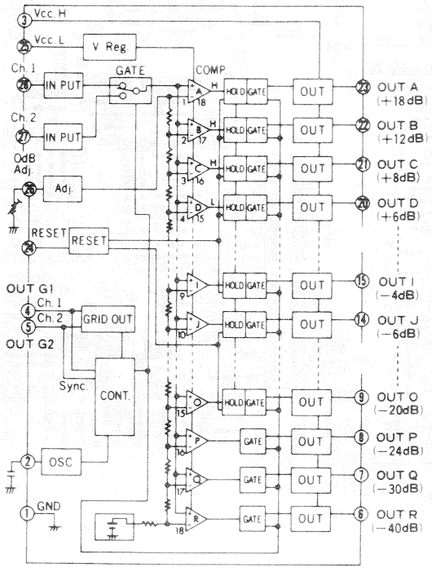
Q301, 302 2SD636(R,S) [2SD636R]

### GRID TERMINATION (FL METER)




## EQUIVALENT CIRCUIT

### IC301 AN6870N




**NOTES:**

- VR301.... FL meter adjustment VR (For 0 dB indication)
- VR302.... FL meter adjustment VR (For −40 dB indication)
- VR501.... Input scanning time adjustment VR
- S501..... Counter reset switch
- S502..... Pause switch
- S503..... Record switch
- S504..... Stop switch
- S505..... Playback switch
- S506..... Fast Forward switch
- S507..... Rewind switch
- S508..... Record mute switch
- S509..... Memory repeat switch
- S510..... Tape/Time select switch
- S511..... Set switch
- S512..... Music select switch
- S513..... Timer switch (shown in REC position: (1) REC, (2) OFF, (3) PLAY)
- S601..... Accidental erase prevention switch
- S602..... Mode switch
- S603..... Stop switch
- S604..... Playback switch
- S605..... Cassette detection switch

  } Mode sensing switches

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.
- The mark (▼) shows test point. e.g. ▽ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. However, the voltae in record mode is indicated in ( ) when it differs from that in record mode. For measurement, use VTVM.
- (▬▬) indicates B + (bias)
- (▬▬) indicates B − (bias)
- (▬▬) indicates the flow of the playback signal (dbx out)
- (▬▬) indicates the flow of the recording signal (dbx out)
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors are diodes. One type of number is used for supply parts number and production parts number when they are identical.

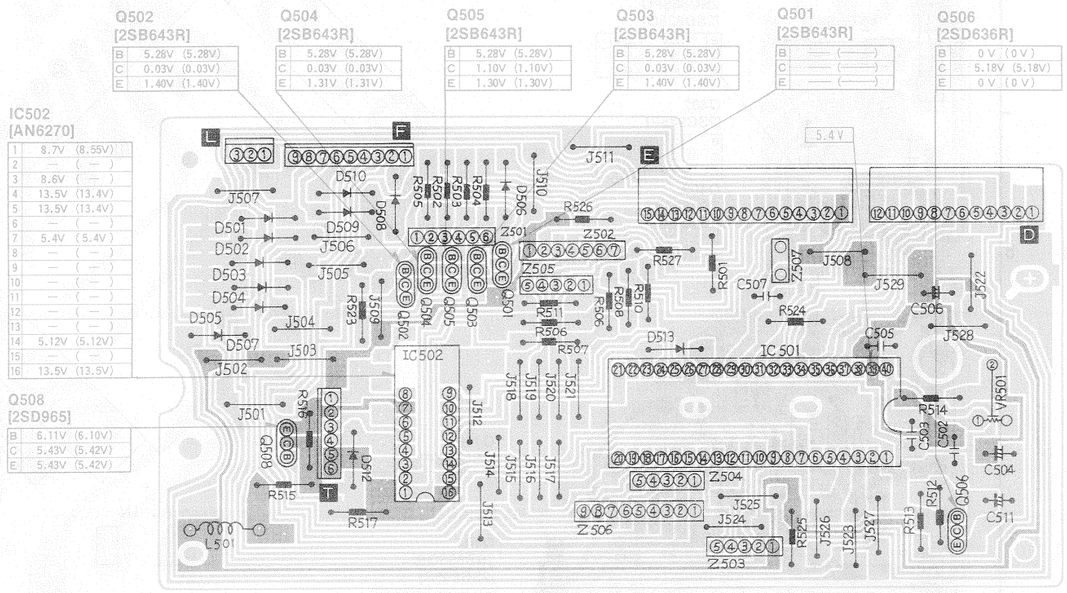
  e.g. Q1
  2SC1844(E,F) ◀ Production parts number
  [2SC1844E] ◀ Supply parts number
  D301
  QVD1S2473T ◀ Production parts number
  [MA161] ◀ Supply parts

- The supply parts number is described alone in the replacement parts list.

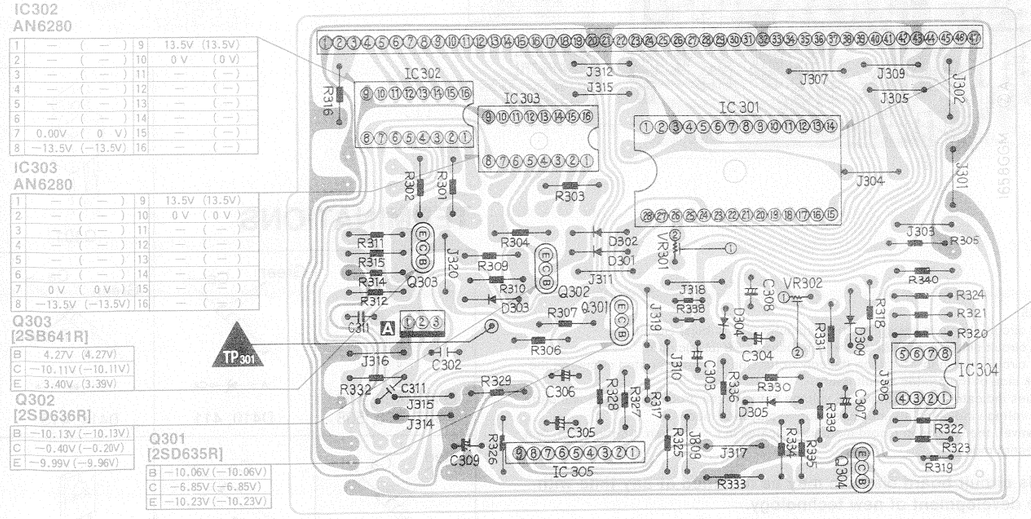
**• This schematic diagram may be modified at any time with the development of new technology.**

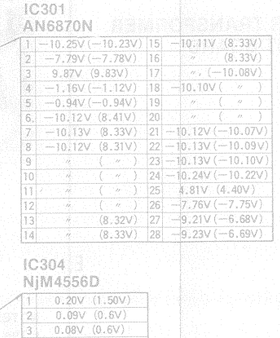
# CIRCUIT BOARDS

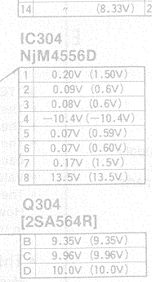
## n MECHANISM CONTROL CIRCUIT BOARD



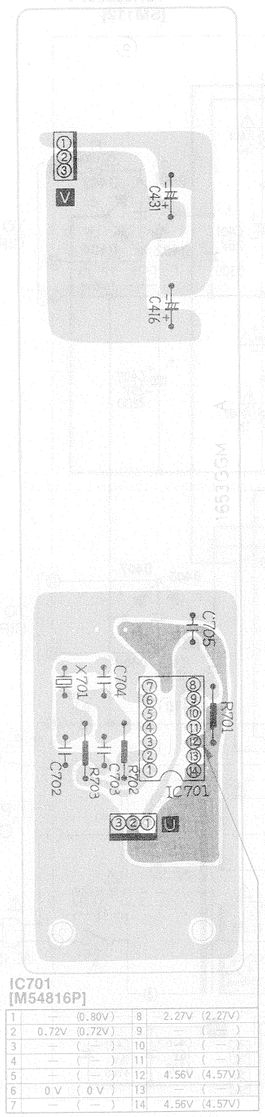

## g FL METER CIRCUIT BOARD



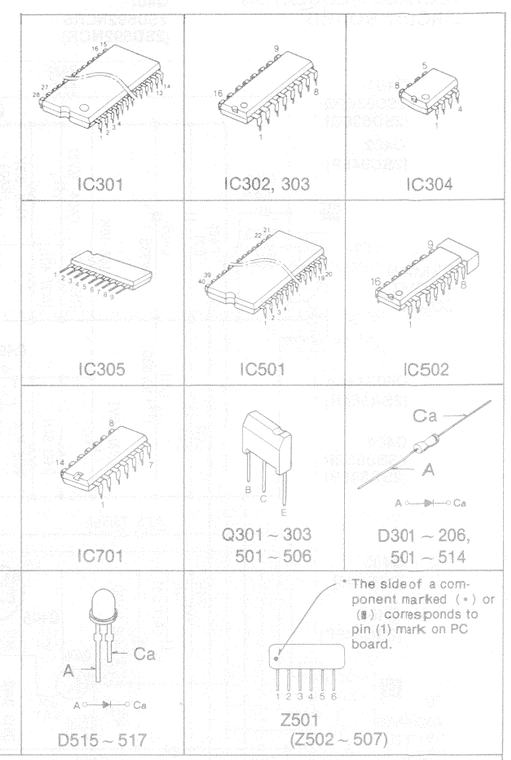



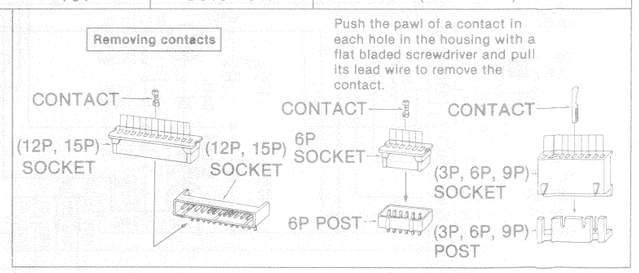




## h QUARTZ CIRCUIT BOARD




## TERMINATIONS

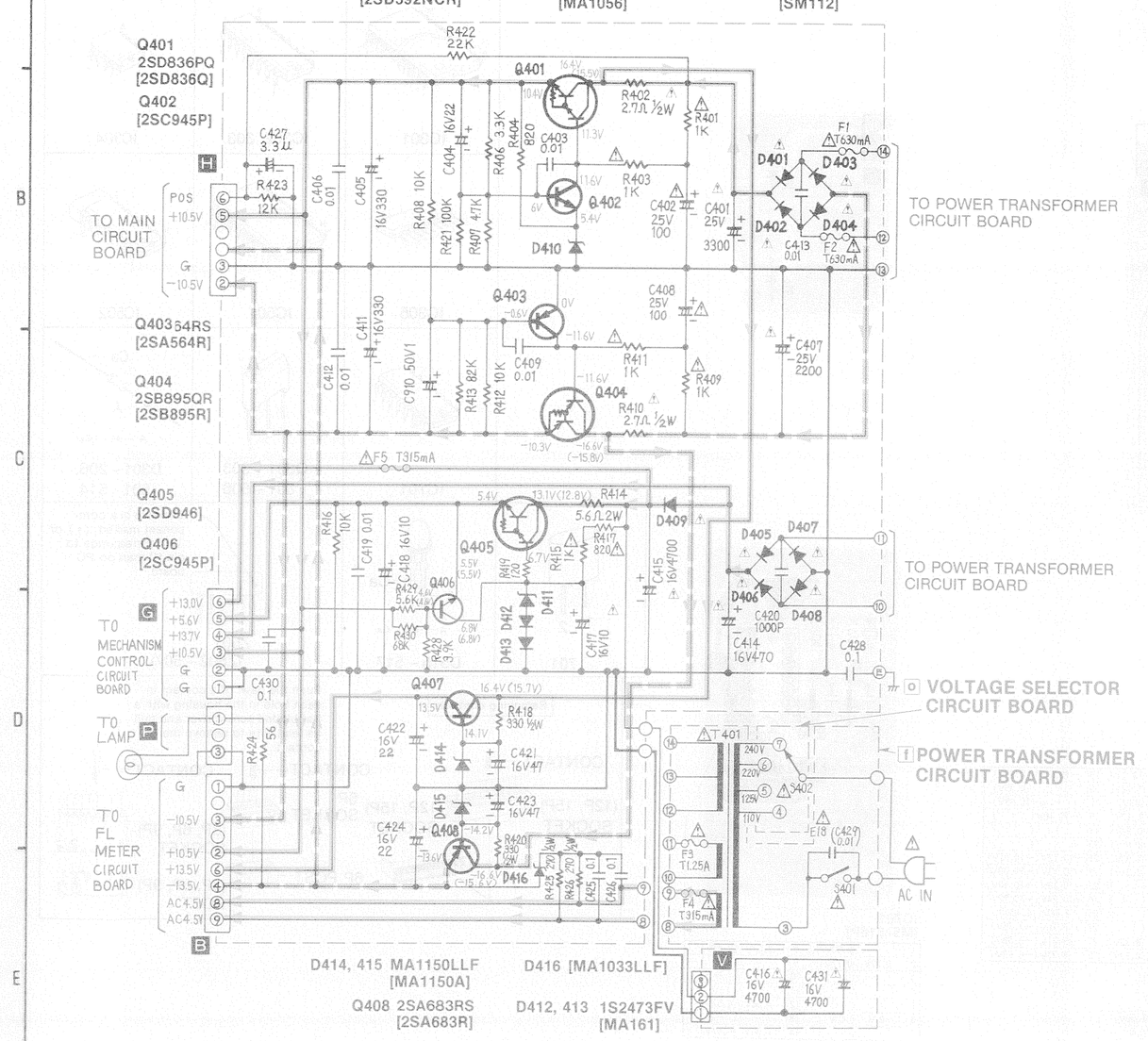



NOTES:
- The circuit shown in ▭ on the conductor is B + (bias) circuit.
- The circuit shown in ▭ on the conductor is B − (bias) circuit.
- Values indicated in ▭ are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  However, the voltage in record mode is indicated in ( )
  For measurement use VTVM
- **This circuit board diagram may be modified at any time with the development of new technology.**

# SCHEMATIC DIAGRAM

## POWER SUPPLY SECTION




**NOTES:**

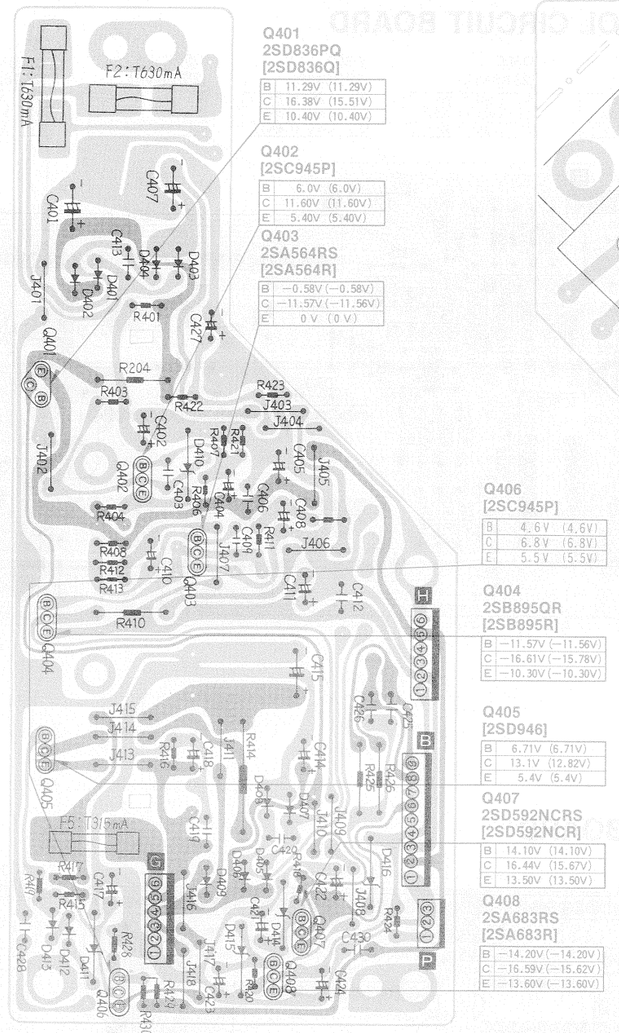
- S401. . . . Power ON/OFF switch.
- S402. . . . AC power voltage select switch
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in microfarads (μF) unless specified otherwise.
  P = Pico-farads.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position.
  However, the voltage in record mode is indicated in ( ).
  For measurement use VTVM.
- (▬) indicates B + (bias).
- (▬) indicates B − (bias).

- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors are diodes.
  One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  2SC1844(E,F) ◄— Production parts number
  [2SC1844E] ◄— Supply parts number
  D301
  QVD1S2473T ◄— Production parts number
  [MA161] ◄— Supply parts
- The supply parts number is described alone in the replacement parts list.
- **This schematic diagram may be modified at any time with the development of new technology.**

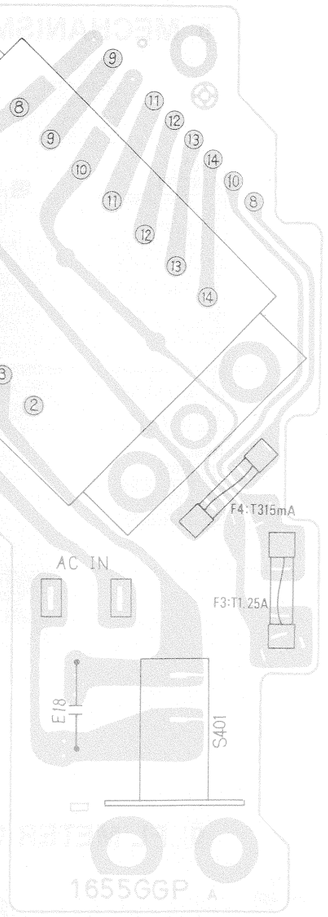


# CIRCUIT BOARDS

## POWER SUPPLY CIRCUIT BOARD




## TRANSFORMER CIRCUIT BOARD

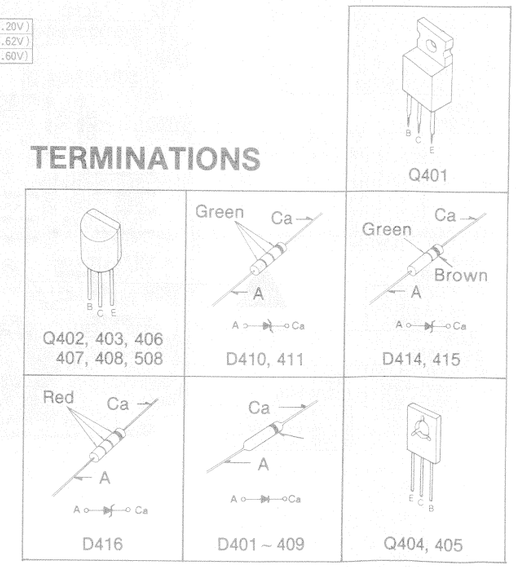



**NOTES:**

- The circuit shown in ▬ on the conductor is + B (bias) circuit.
- The circuit shown in ▬ on the conductor is −B (bias)circuit.
- The circuit shown in ▬ on the conductor side indicates printed circuit on the back side of the printed circuit board.
- Values indicated in ▭ are DC voltage between the ground and electrical parts.
- The voltage indicates are measured during playback mode.
  However, the voltage in record mode is indicates in ( ) when it differs from that in record mode.

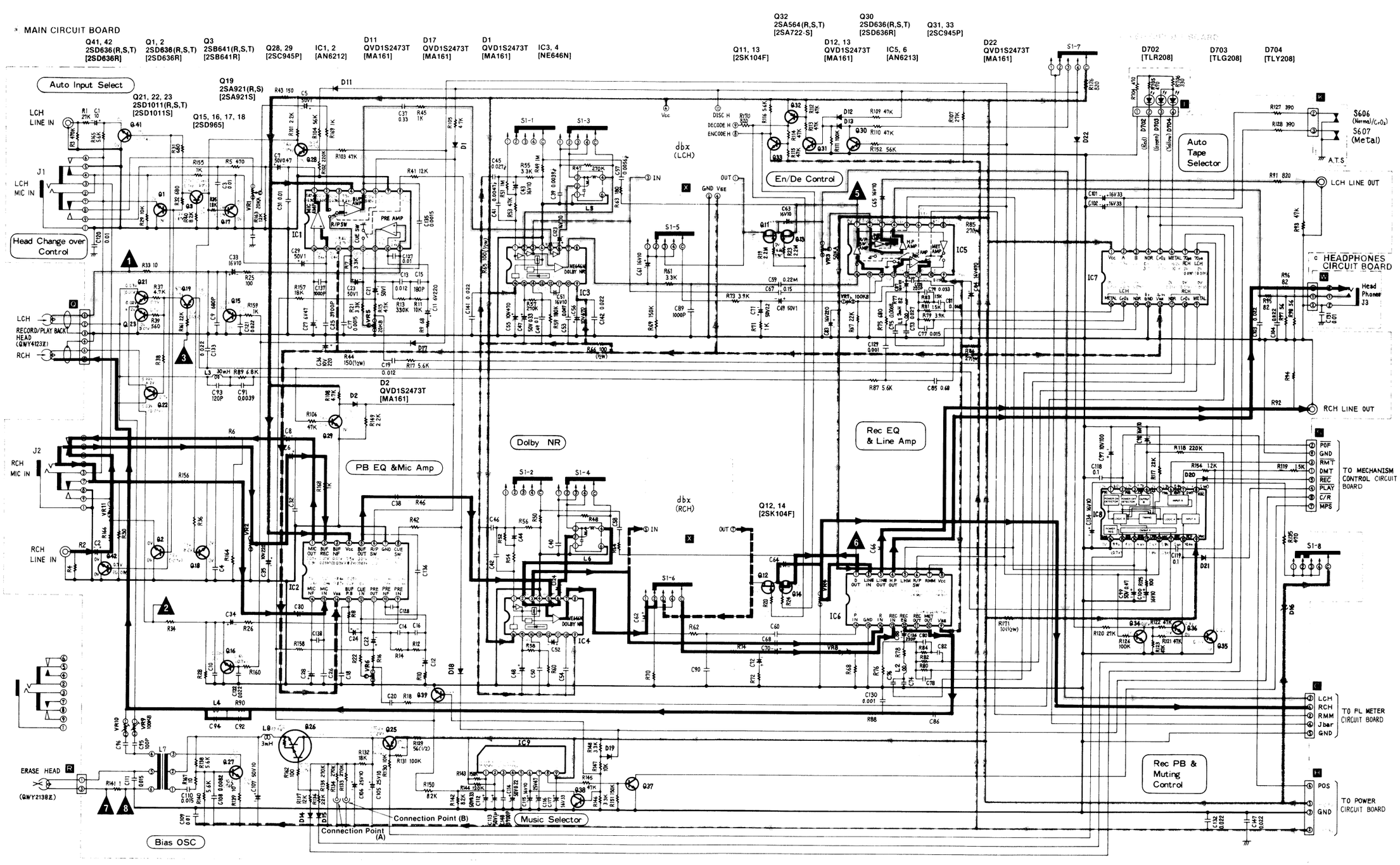
- **This circuit board diagram may be modified at any time with the development of new technology.**

## TERMINATIONS



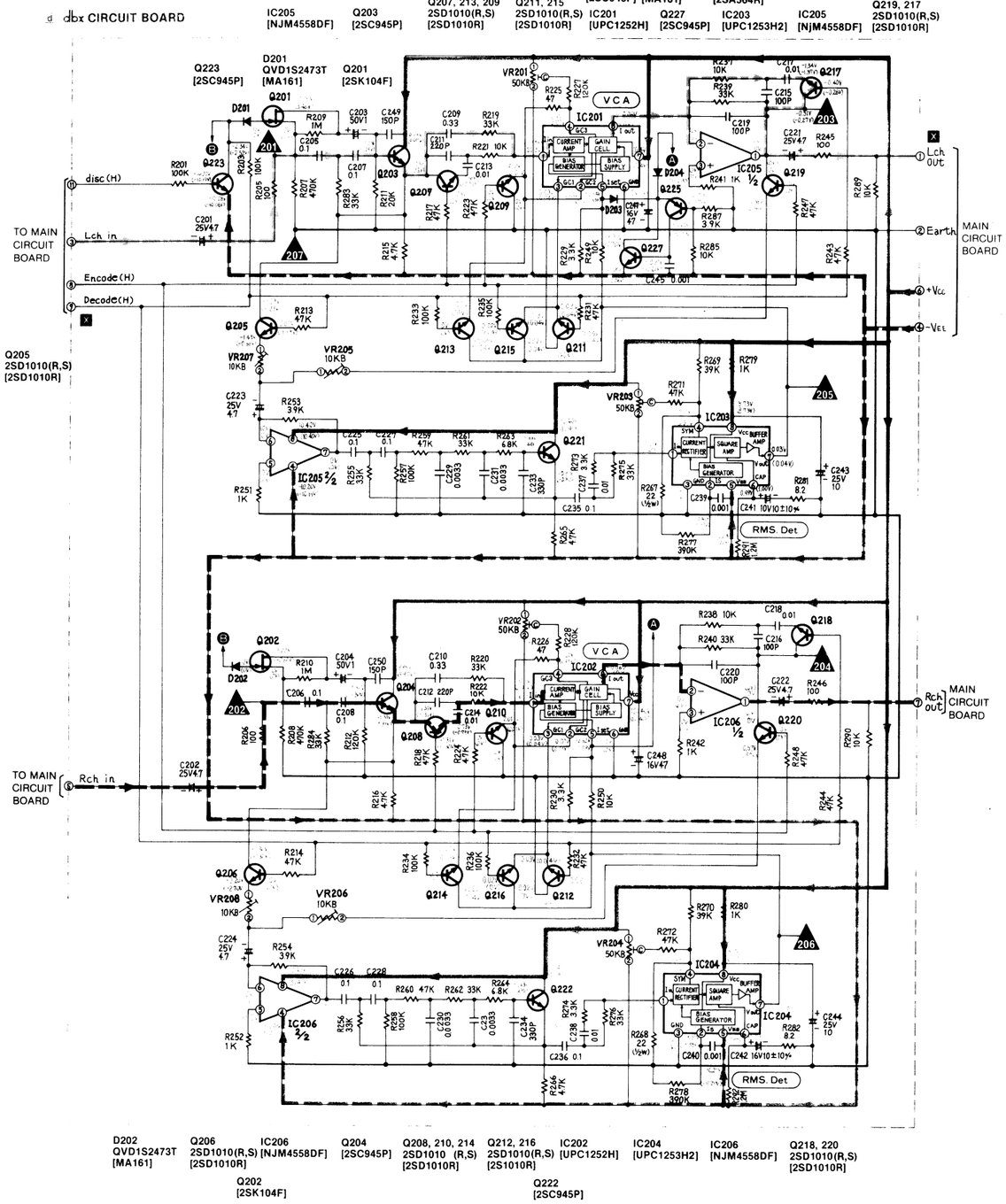
RS-M255X RS-M255X

# SCHEMATIC DIAGRAM
# MAIN SECTION




## dbx SECT

# dbx SECTION

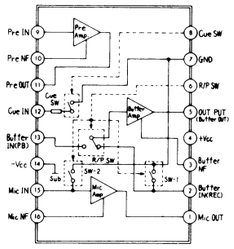



S606 (Normal/$CrO_2$)
S607 (Metal)
A.T.S.
LCH LINE OUT
HEADPHONES CIRCUIT BOARD
Head Phones J3
RCH LINE OUT
POF
GND
RMT
DMT
REC
PLAY
C/R
MPS
TO MECHANISM CONTROL CIRCUIT BOARD
LCH
RCH
RMM
Jbar
GND
TO FL METER CIRCUIT BOARD
POS
+10.5V
GND
-10.5V
TO POWER CIRCUIT BOARD

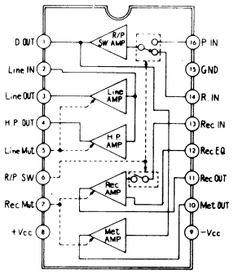


# EQUIVALENT CIRCUITS

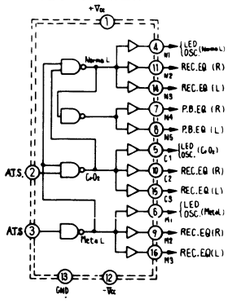
**IC1,2 AN6212**



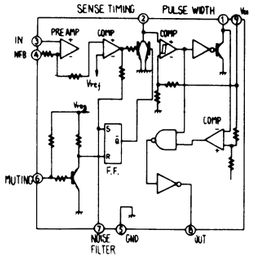
**IC5,6 AN6213**



**IC7 AN6256**



**IC9 BA336**



■ **Truth table of IC1, 2** (Postive)

R / P SW

| ⑥pin | Operation |
|---|---|
| H | REC |
| L | PB |

SW-1, SW-2

| ⑥pin | Operation |
|---|---|
| H | —— |
| L | Mute |

Cue SW

| ⑧pin | Operation |
|---|---|
| H | —— |
| L | Cue |

■ **Truth table of IC5, 6** (Positive)

R / P SW

| ⑥pin | Operation |
|---|---|
| H | REC |
| L | PB |

Muting

| ⑤, ⑦Pin | Operation |
|---|---|
| H | Muting OFF |
| L | Muting ON |

L : GND Level

**NOTES:**
- S1-1 ~ S1-8 ..... NR select switch (shown in OUT position: (1) Dolby NR, (2) OUT, (3) dbx tape, (4) dbx disc)
- S606 ..... Auto tape select switch (For Normal/$CrO_2$ tape)
- S607 ..... Auto tape select switch (For Metal tape)

| Mode | S606 | S607 |
|---|---|---|
| Normal | on | on |
| $CrO_2$ | on | off |
| Metal | off | off |

- VR1, 2. ..... Input level controls.
- VR3, 4. ..... Output level control.
- VR5, 6. ..... Playback gain adjustment VR.
- VR7, 8. ..... Recording gain adjustment VR.
- VR9, 10. ..... Bias current adjustment VR.
- VR201, 202. ..... VCA symmetry adjustment VR.
- VR203, 204. ..... RMS detector adjustment VR.
- VR205, 206. ..... dbx standard level adjustment VR (Encode).
- VR207, 208. ..... dbx standard level adjustment VR (Decode).
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000 (Ω), 1M = 1,000 k (Ω)
- Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.
- The mark (▼) shows test point. e.g. ▼ = test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified
  - ○ Voltage values shown in MAIN SECTION.
    - NO MARK.... Voltage values at out (NR select switch) mode
    - ( ..... Voltage values at record mode.
    - ] ..... Voltage values at disc (NR select switch) mode
  - ○ Voltage values shown in dbx SECTION.
    - ) ..... Voltage values at out (NR select switch) mode.
    - ] ..... Voltage values at disc (NR select switch) mode. For measurement use VTVM.
- (▬▶) indicates B + (bias).
- (◀▬) indicates B – (bias).
- (▬▶) indicates the flow of the playback signal (dbx out).
- (◀▬) indicates the flow of the playback signal (dbx tape).
- (▬▶) indicates the flow of the recording signal (dbx out).
- (◀▬) indicates the flow of the recording signal (dbx tape).
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes. One type of number is used for supply parts number and production parts number when they are identical.
  - e.g. Q1
    - 2SC1844 (E, F) ◀ Production parts number
    - [2SC1844E] ◀ Supply parts number
    - D212
    - 1S2473T77 ◀ Production parts number.
    - [MA161] ◀ Supply parts numbers
- The supply parts number is described alone in the replacement parts list.
- **This schematic diagram may be modified at any time with the development of new technology.**

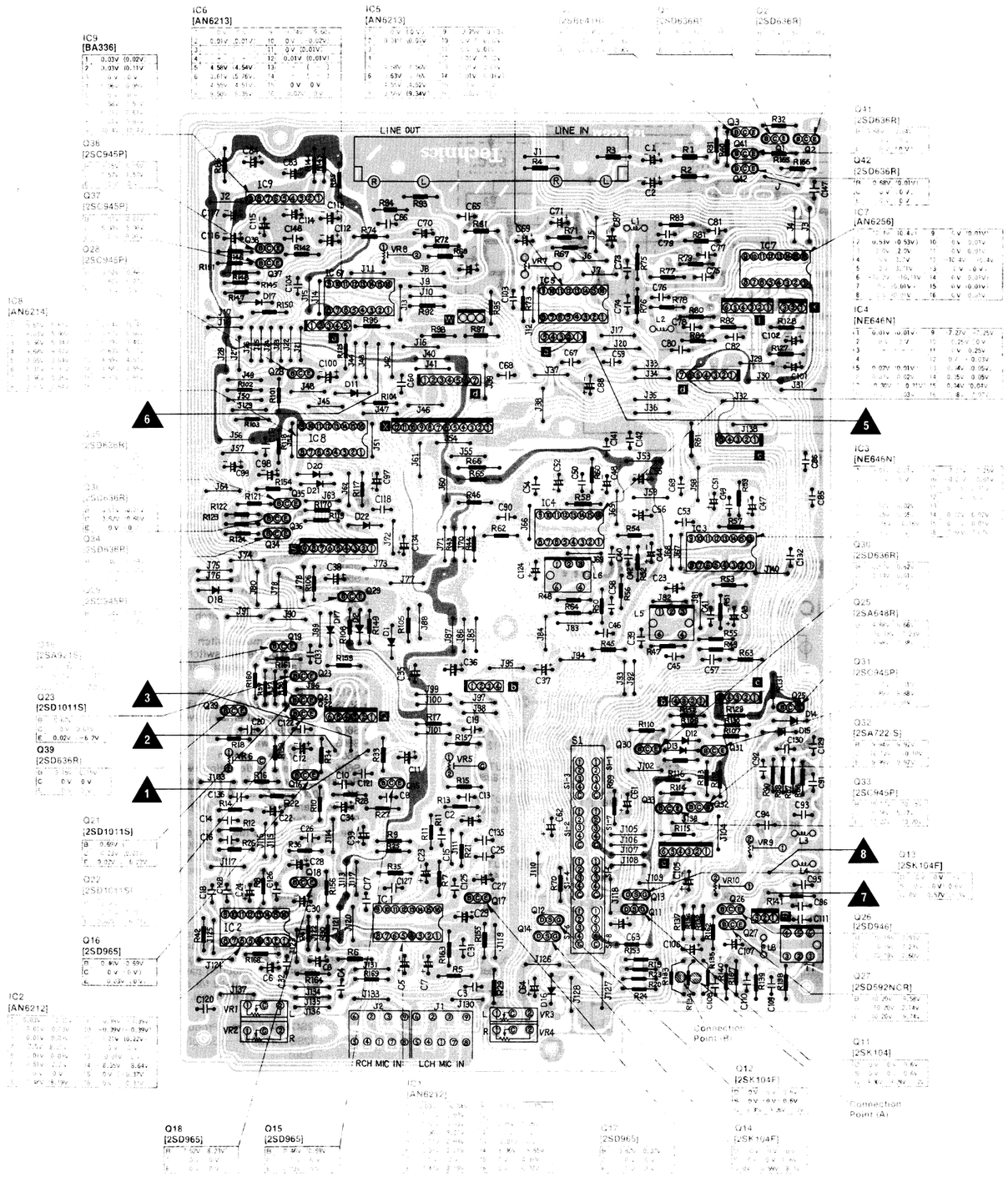
## SPECIFICATIONS

* Input level controls ··· MAX
* Output level control ··· MAX

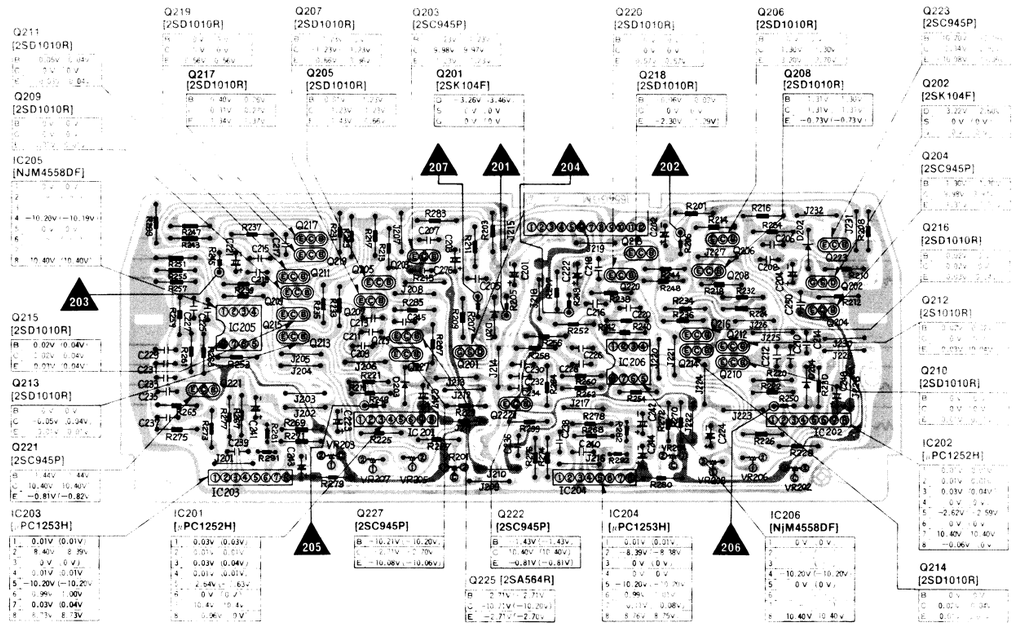
| | |
|---|---|
| Playback S/N ratio<br>* Test tape ··· QZZCFM | Greater than 45 dB |
| Overall distortion<br>* Test tape<br>··· QZZCRA for Normal<br>··· QZZCRX for $CrO_2$<br>··· QZZCRZ for Metal | Less than 4 % |
| Overall S/N ratio<br>* Test tape ··· QZZCRA | Greater than 43 dB<br>(without NAB filter) |

# CIRCUIT BOARDS

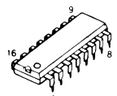
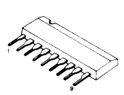
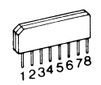
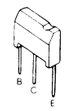
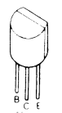
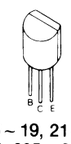
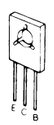
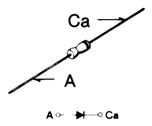
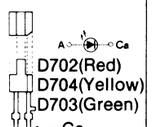
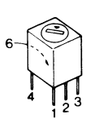
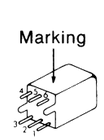
## [a] MAIN CIRCUIT BOARD

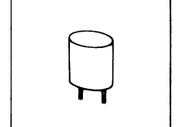



## [d] dbx CIRCUIT BOARD




## TERMINATIONS

| | | | | | |
|---|---|---|---|---|---|
|  IC1 ~ 8 |  IC9 |  IC201 ~ 204 |  IC205, 206 |  Q1 ~ 3, 30, 34, 35, 36, 39, 41, 42, 203, 204, 221 ~ 223, 227 |  Q12 ~ 14, 25, 28, 29, 31, 32, 33, 37, 38, 201, 202 |
|  Q15 ~ 19, 21 ~ 23, 27, 205 ~ 220, 225 |  Q26 |  D1, 2, 11 ~ 22, 201 ~ 204 |  D702(Red) D704(Yellow) D703(Green) |  L5, 6 |  L7 |

 L1, 2, 8 3, 4

**NOTES:**

- The circuit shown in ▬ on the conductor is B + (bias) circuit.
- The circuit shown in ▭ on the conductor is B − (bias) circuit.
- Values indicated in [ ] are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  - ○ Voltage values shown in MAIN CIRCUIT BOARD
    - NO MARK. . . Voltage values at Out (NR select switch) mode
    - ( ) . . . . . Voltage values at record mode
    - { } . . . . . Voltage values at disc (NR select switch) mode
  - ○ Voltage values shown in dbx CIRCUIT BOARD
    - NO MARK. . . Voltage values at dbx tape (NR select switch) mode
    - ( ) . . . . . Voltage values at Out (NR select switch) mode.

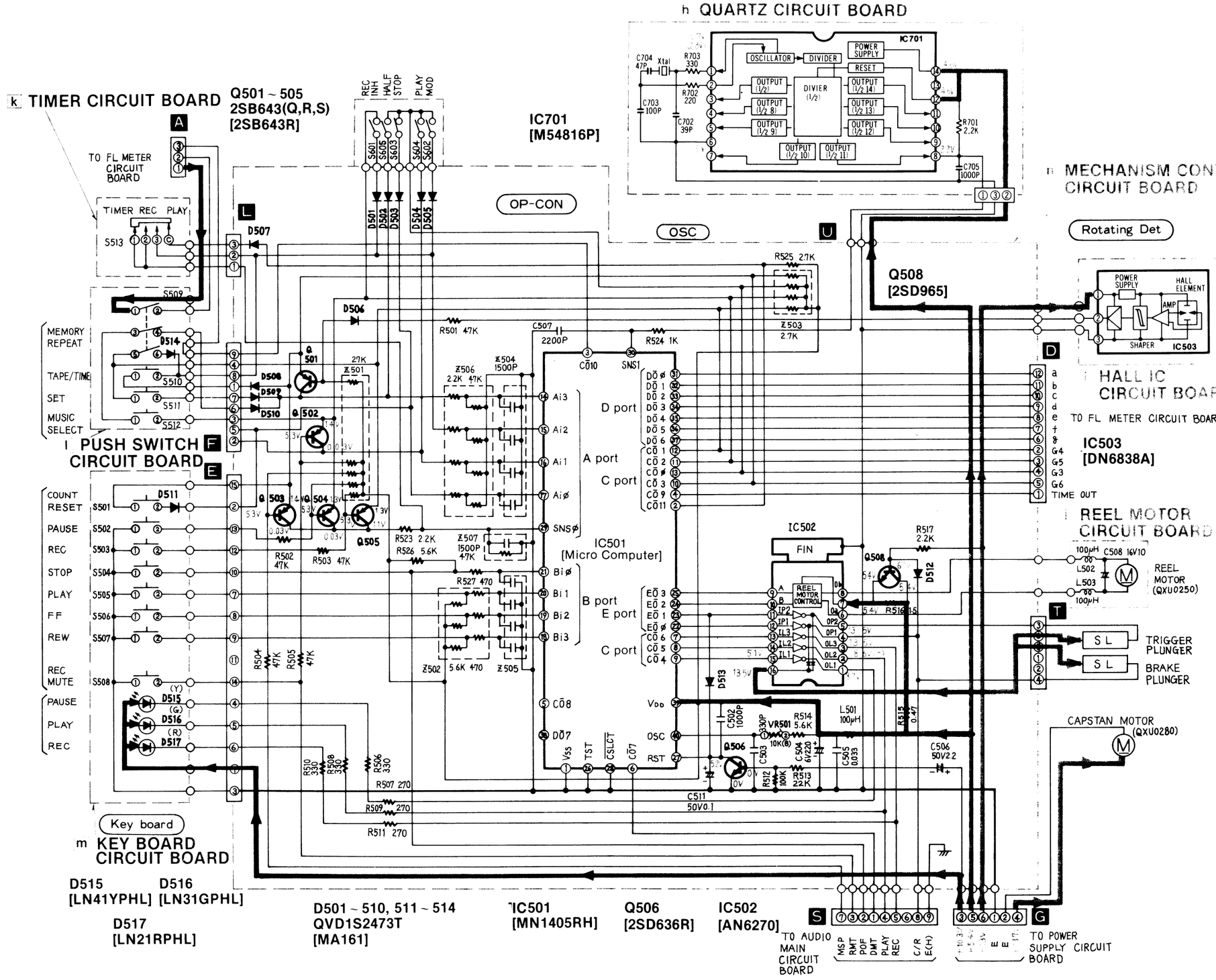
  For measurement use VTVM.

**• This circuit board diagram may be modified at any time with the development of new technology.**

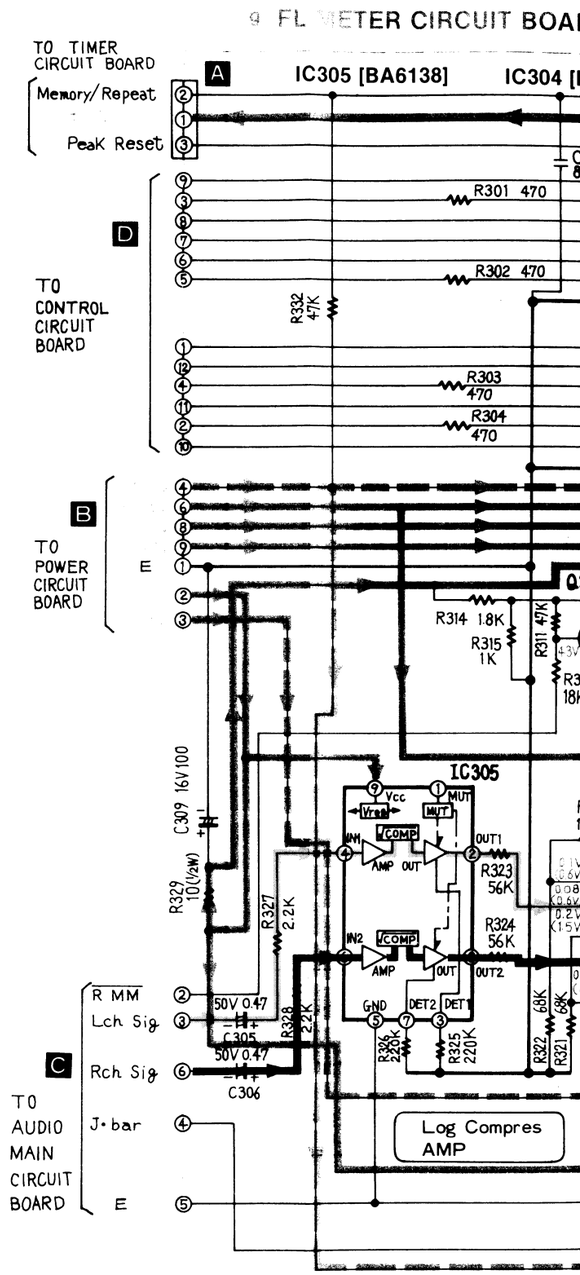
RS-M255X RS-M255X

# SCHEMATIC DIAGRAM

## MECHANISM CONTROL SECTION



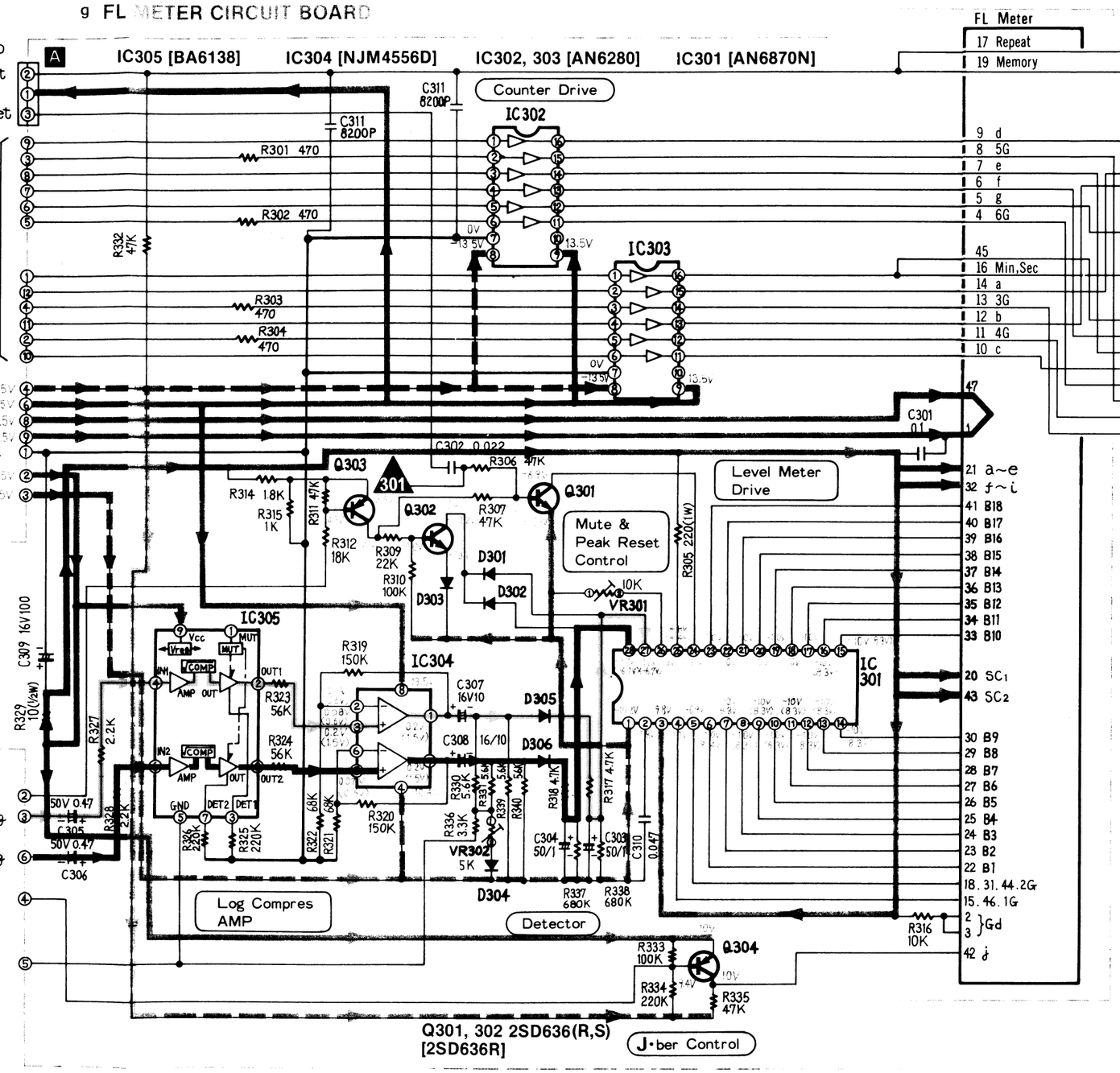

## FL METER SECTION



9 10 11 12 13 14 15 16 17

## ER SECTION

g FL METER CIRCUIT BOARD




D301 ~ 303 QVD1S2473T
305, 306 [MA161]

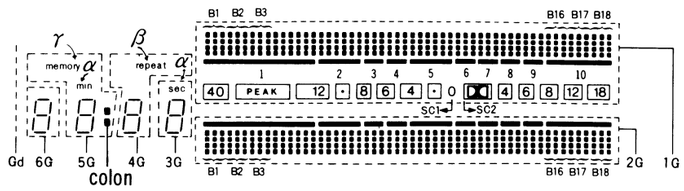
D304 1S2473FV
[MA161]

Q303 2SB641(R,S)
[2SB641R]

Q304 2SA564(R,S,T)
[2SA564R]

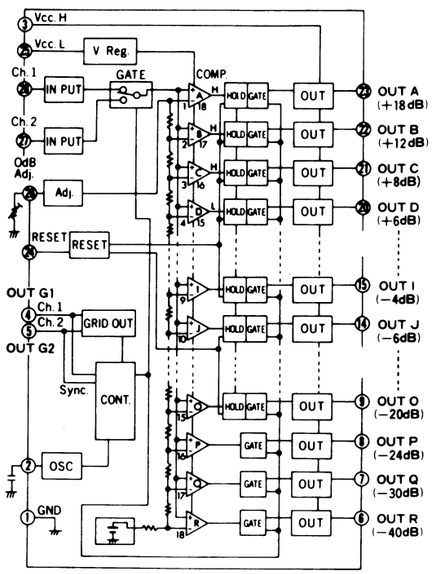


### GRID TERMINATION (FL METER)




## EQUIVALENT CIRCUIT

### IC301 AN6870N




**NOTES:**

- VR301.... FL meter adjustment VR (For 0 dB indication)
- VR302.... FL meter adjustment VR (For − 40 dB indication)
- VR501.... Input scanning time adjustment VR
- S501..... Counter reset switch
- S502..... Pause switch
- S503..... Record switch
- S504..... Stop switch
- S505..... Playback switch
- S506..... Fast Forward switch
- S507..... Rewind switch
- S508..... Record mute switch
- S509..... Memory repeat switch
- S510..... Tape/Time select switch
- S511..... Set switch
- S512..... Music select switch
- S513..... Timer switch (shown in REC position: (1) REC, (2) OFF, (3) PLAY)
- S601..... Accidental erase prevention switch
- S602..... Mode switch
- S603..... Stop switch
- S604..... Playback switch
- S605..... Cassette detection switch

} Mode sensing switches

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. However, the voltae in record mode is indicated in ( ) when it differs from that in record mode. For measurement, use VTVM.
- (▬▬) indicates B + (bias)
- (▬▶▬) indicates B − (bias)
- (▬▬) indicates the flow of the playback signal (dbx out)
- (▬▶▬) indicates the flow of the recording signal (dbx out)
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors are diodes. One type of number is used for supply parts number and production parts number when they are identical.

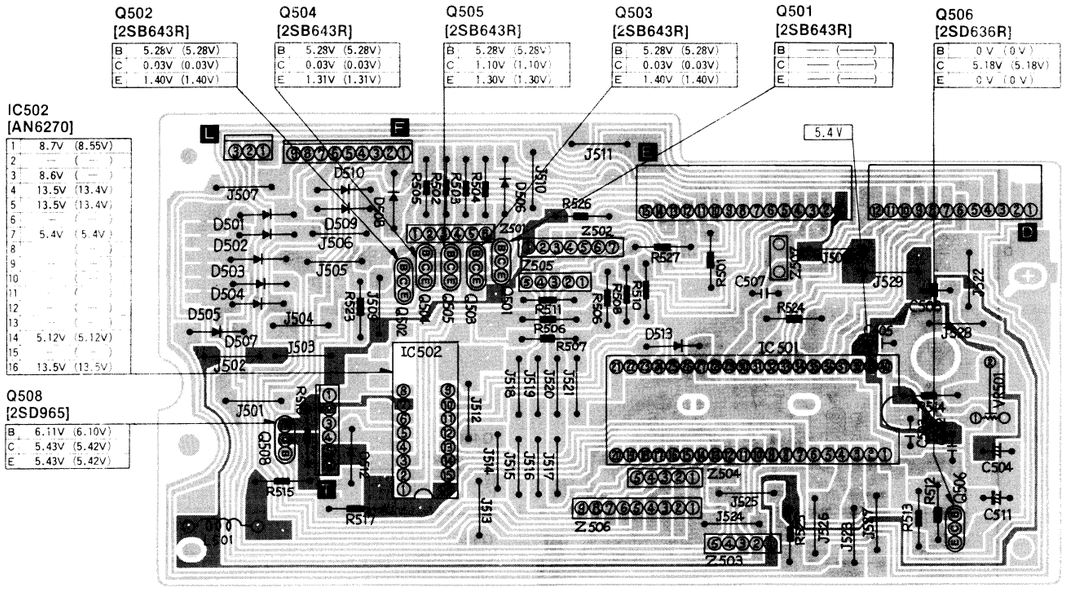
e.g. Q1
2SC1844(E,F) ◀ Production parts number
[2SC1844E] ◀ Supply parts number
D301
QVD1S2473T ◀ Production parts number
[MA161] ◀ Supply parts

- The supply parts number is described alone in the replacement parts list.

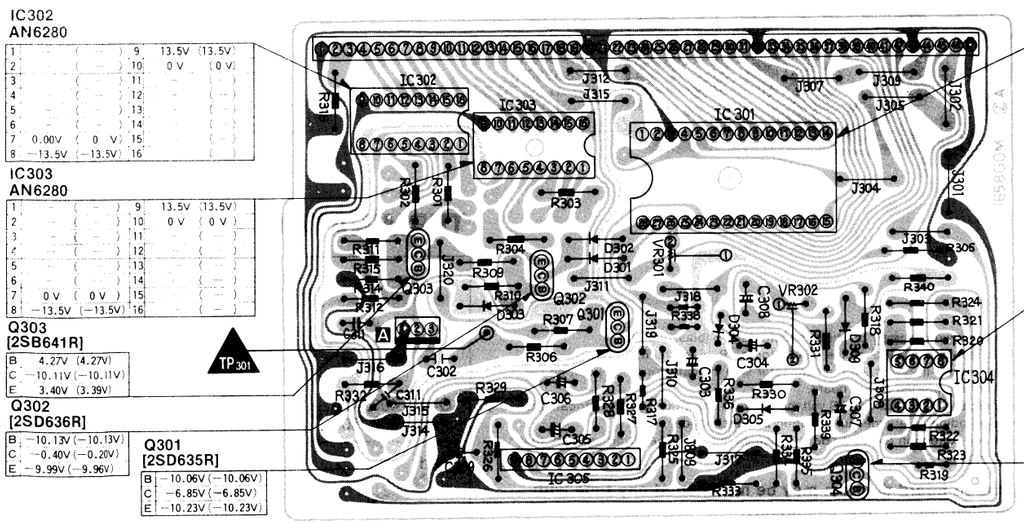
**• This schematic diagram may be modified at any time with the development of new technology.**

# CIRCUIT BOARDS

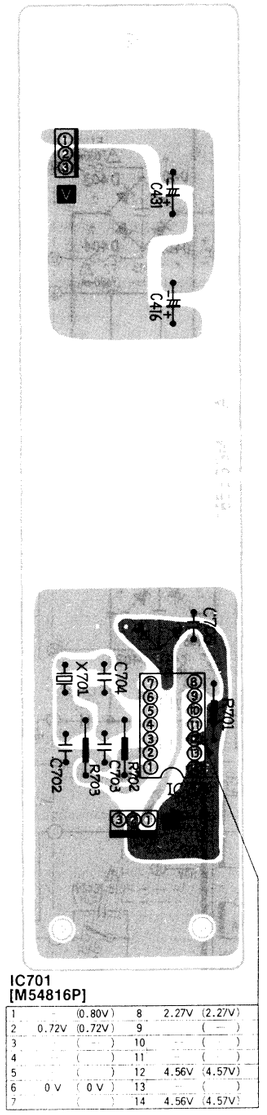
## n MECHANISM CONTROL CIRCUIT BOARD



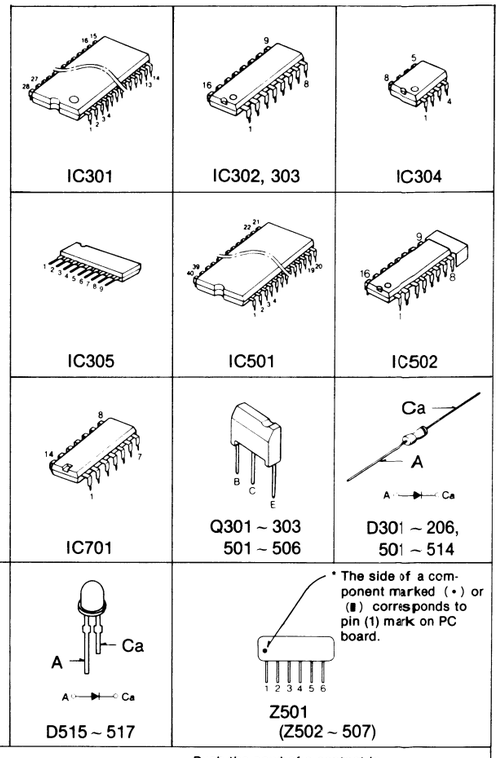

## g FL METER CIRCUIT BOARD




## h QUARTZ CIRCUIT BOARD

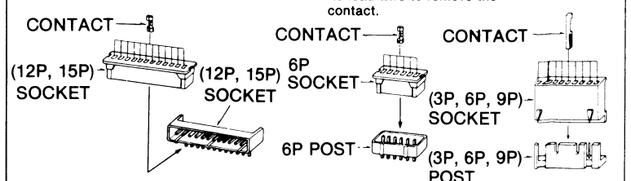



## TERMINATIONS




**Removing contacts**

Push the pawl of a contact in each hole in the housing with a flat bladed screwdriver and pull its lead wire to remove the contact.

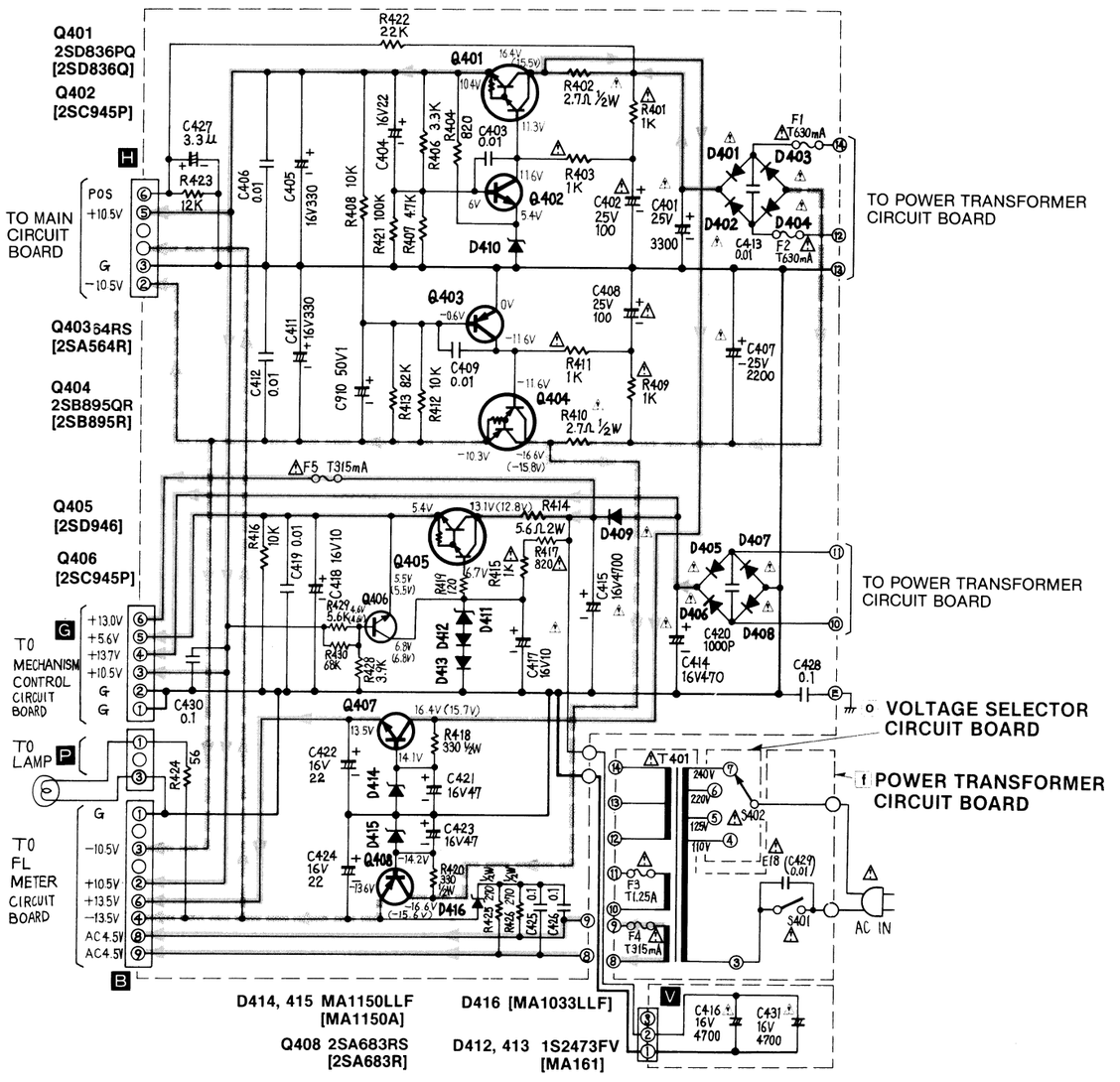



**NOTES:**

- The circuit shown in ▬ on the conductor is B + (bias) circuit.
- The circuit shown in ▬ on the conductor is B – (bias) circuit.
- Values indicated in ▭ are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  However, the voltage in record mode is indicated in ( )
  For measurement use VTVM
- **This circuit board diagram may be modified at any time with the development of new technology.**

# SCHEMATIC DIAGRAM

## POWER SUPPLY SECTION




**NOTES:**

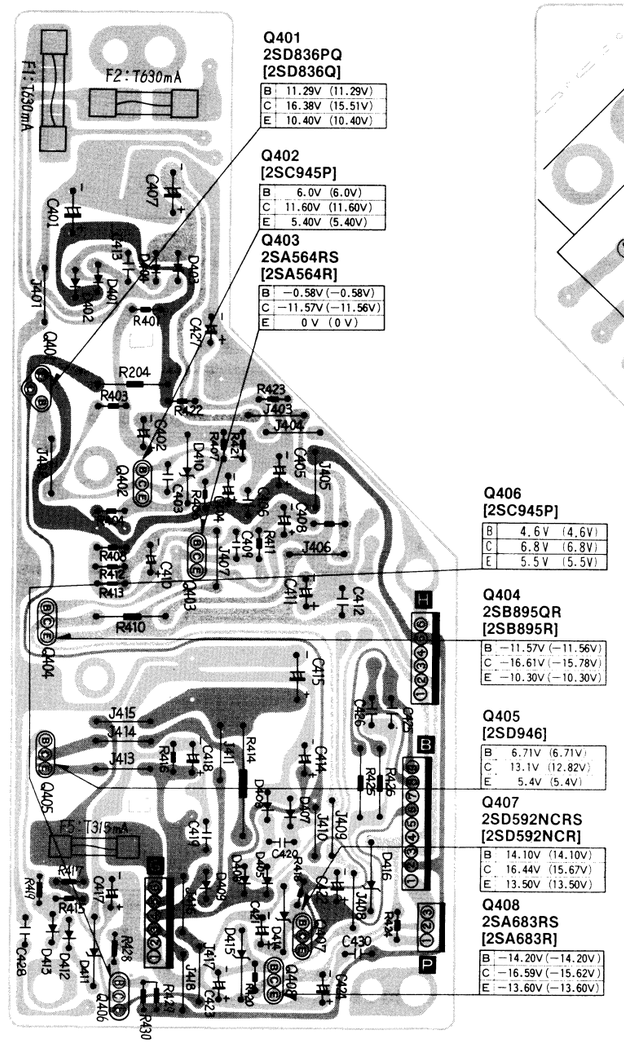
- S401. . . . Power ON/OFF switch.
- S402. . . . AC power voltage select switch
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in microfarads (μF) unless specified otherwise.
  P = Pico-farads.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position.
  However, the voltage in record mode is indicated in ( ).
  For measurement use VTVM.
- ( ) indicates B + (bias).
- ( ) indicates B – (bias).

- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors are diodes. One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  2SC1844(E,F) ← Production parts number
  [2SC1844E] ← Supply parts number
  D301
  QVD1S2473T ← Production parts number
  [MA161] ← Supply parts
- The supply parts number is described alone in the replacement parts list.
- **This schematic diagram may be modified at any time with the development of new technology.**

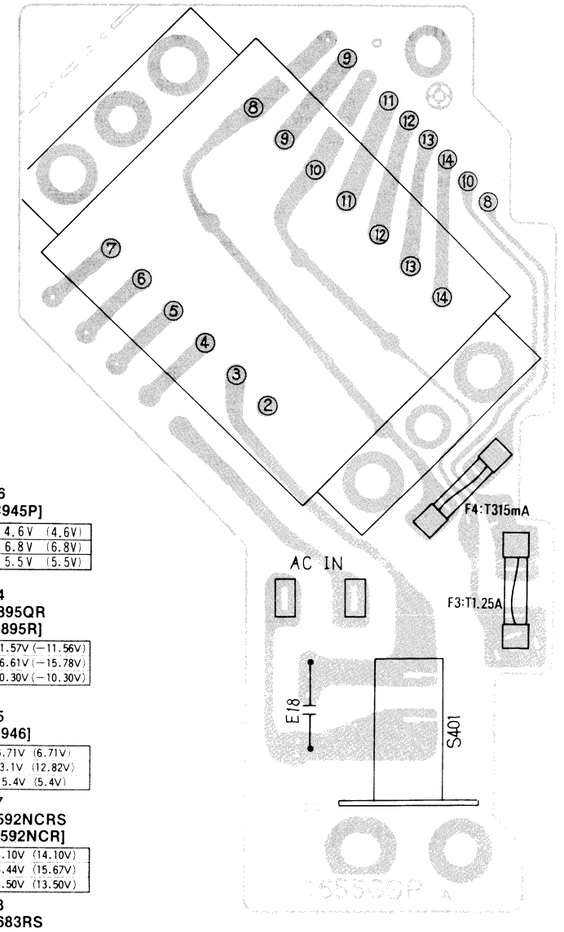


# CIRCUIT BOARDS

## POWER SUPPLY CIRCUIT BOARD




## TRANSFORMER CIRCUIT BOARD

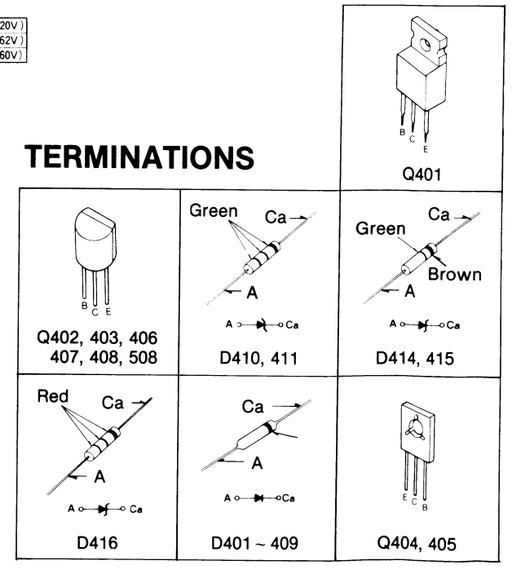



**NOTES:**

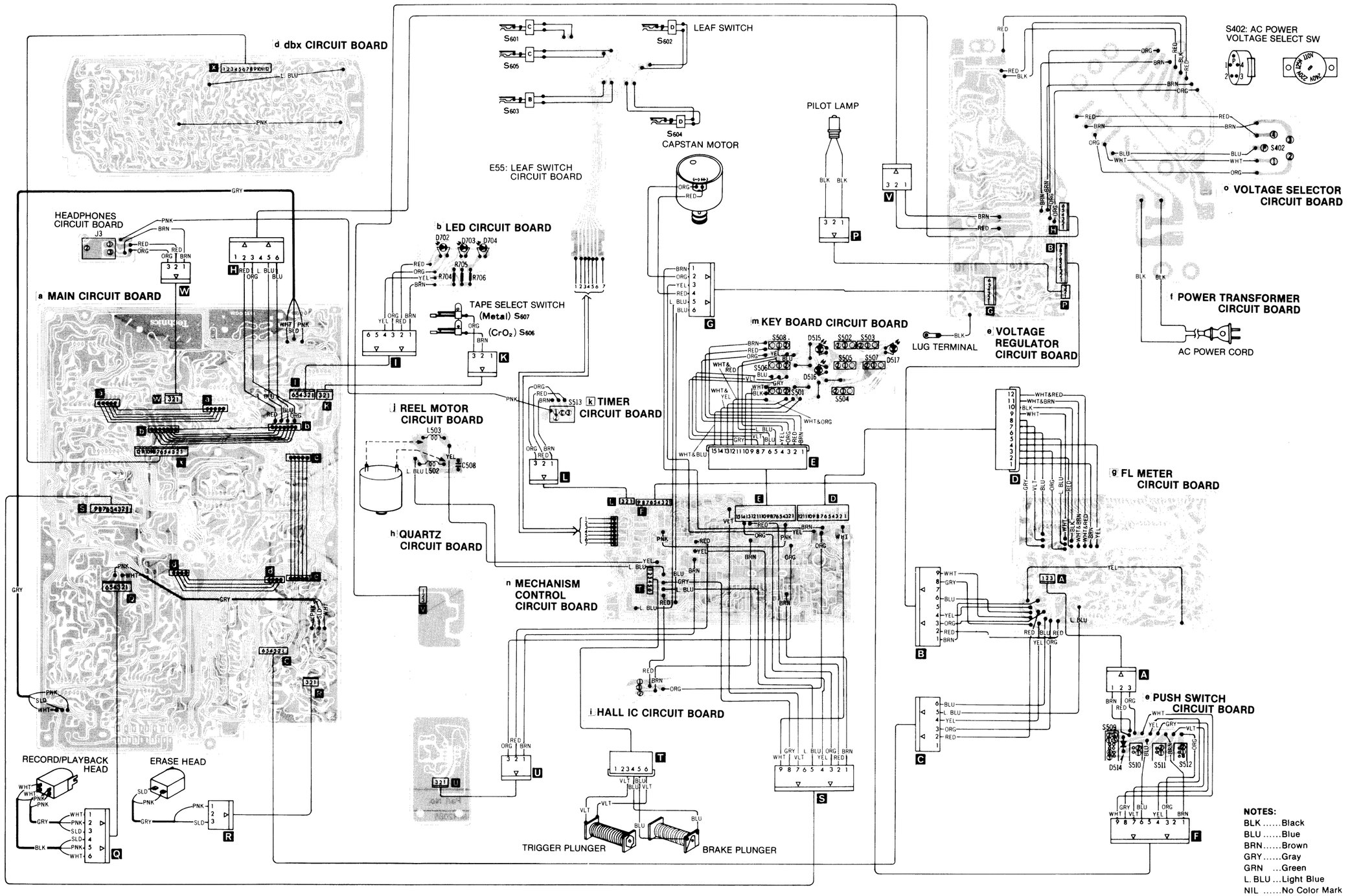
- The circuit shown in ▬ on the conductor is + B (bias) circuit.
- The circuit shown in ▬ on the conductor is −B (bias)circuit.
- The circuit shown in ▬ on the conductor side indicates printed circuit on the back side of the printed circuit board.
- Values indicated in ▭ are DC voltage between the ground and electrical parts.
- The voltage indicates are measured during playback mode.
  However, the voltage in record mode is indicates in ( ) when it differs from that in record mode.

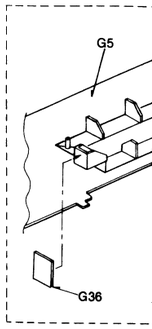
- **This circuit board diagram may be modified at any time with the development of new technology.**

## TERMINATIONS



# WIRING CONNECTION DIAGRAM



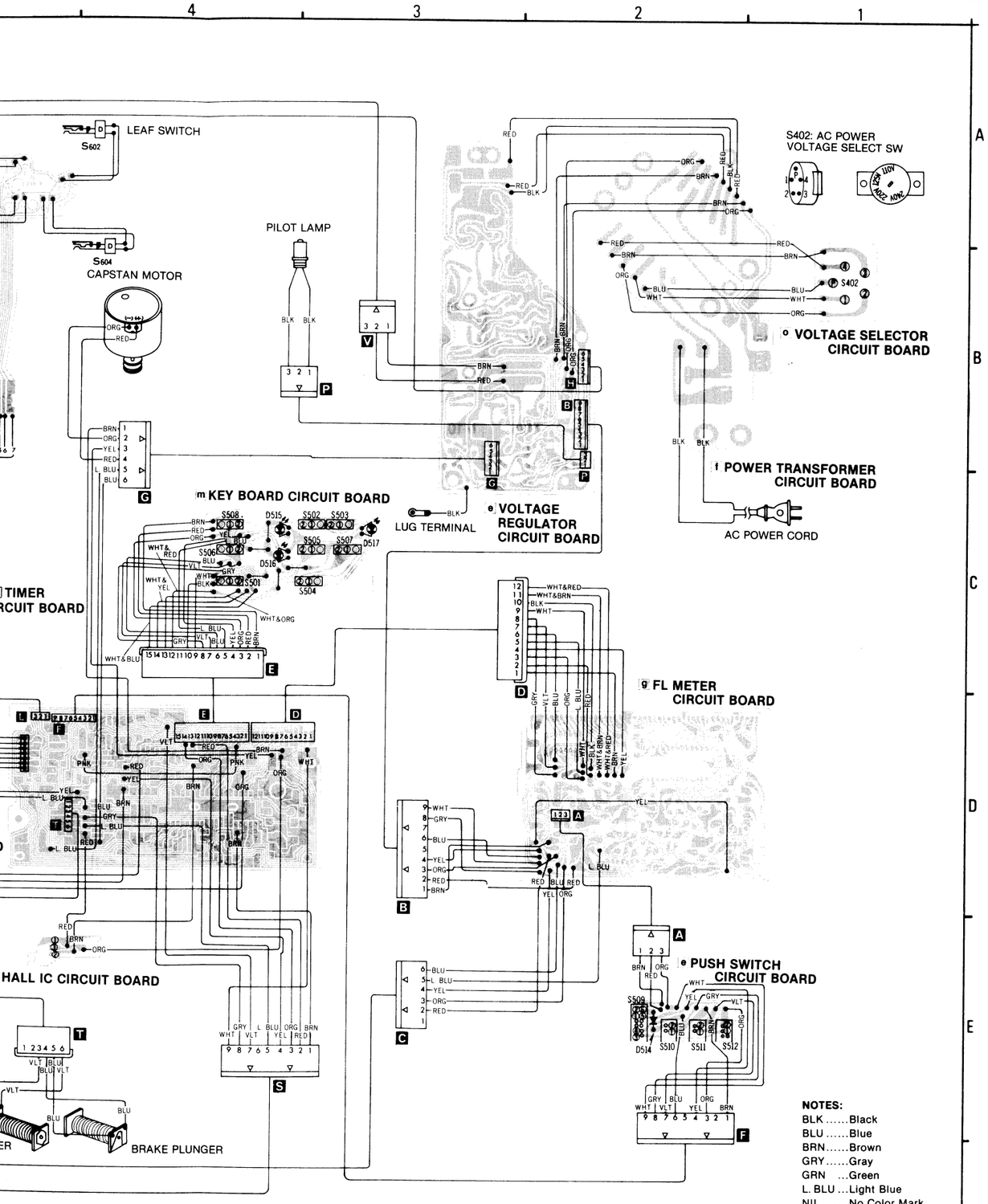




**NOTES:**

BLK .....Black
BLU .....Blue
BRN.....Brown
GRY.....Gray
GRN ...Green
L. BLU ...Light Blue
NIL .....No Color Mark
ORG ...Orange
PNK.....Pink
RED.....Red
SLD .....Shield Wire
VLT .....Violet
WHT.....White
YEL .....Yellow

## REPLACEMENT PARTS LIST

| Ref No. | Part No. | Part Name & Descrip |
|---|---|---|
| | **CABINET PARTS** | |
| G 1 | QGCM0058 | Case Caver |
| | "Silver Type" | |
| | QGCM0058K | Case Cover |
| | "Black Type" | |
| G 2 | QKA1086 | Case Foot |
| G 3 | QGK3201 | Side Board |
| | "Silver Type" | |
| | QGK3201K | Side Board |
| | "Black Type" | |
| G 4 | QBG1736 | P.B Cushion |
| G 5 | QGK3223D | Meter Cover |
| | "Silver Type" | |
| | QGK3223K | Meter Cover |
| | "Black Type" | |
| G 6 | QGL1174 | Filter |
| G 7 | QYB0411 | Button Cover Assem |
| G 8 | QYP1084 | Front Panel Assembl |
| | "Silver Type" | |
| | QYP1085 | Front Panel Assemb |
| | "Black Type" | |
| G 9 | QGK3222B | Operation Panel |
| | "Silver Type" | |
| | QGK3222K | Operation Panel |
| | "Black Type" | |
| G 10 | QKJ0518 | Push Button Holder |
| G 11 | QXB0758 | Operation Button (Pl |
| G 12 | QXB0759 | Operation Button (Pa |
| G 13 | QXB0760 | Operation Button (Re |
| G 14 | QGO1990 | Operation Button (Re |
| | "Silver Type" | |



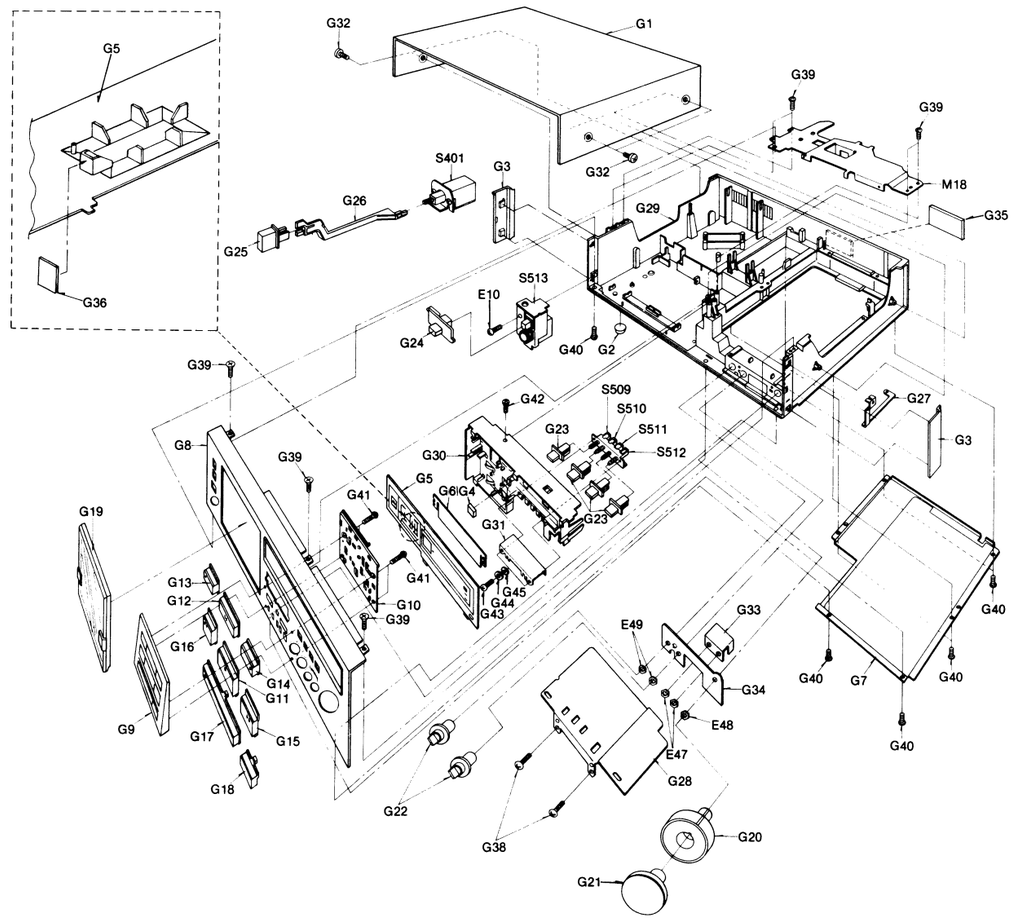

**NOTES:**

BLK .....Black
BLU .....Blue
BRN.....Brown
GRY.....Gray
GRN ...Green
L. BLU ...Light Blue
NIL .....No Color Mark
ORG ...Orange
PNK.....Pink
RED.....Red
SLD .....Shield Wire
VLT .....Violet
WHT.....White
YEL .....Yellow



RS-M255X

# CABINET PARTS LOCATION




## REPLACEMENT PARTS LIST

| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| | | **CABINET PARTS** |
| G 1 | QGCM0058 "Silver Type" | Case Caver |
| | QGCM0058K "Black Type" | Case Cover |
| G 2 | QKA1086 | Case Foot |
| G 3 | QGK3201 "Silver Type" | Side Board |
| | QGK3201K "Black Type" | Side Board |
| G 4 | QBG1736 | P.B Cushion |
| G 5 | QGK3223D "Silver Type" | Meter Cover |
| | QGK3223K "Black Type" | Meter Cover |
| G 6 | QGL1174 | Filter |
| G 7 | QYB0411 | Button Cover Assembly |
| G 8 | QYP1084 "Silver Type" | Front Panel Assembly |
| | QYP1085 "Black Type" | Front Panel Assemlbly |
| G 9 | QGK3222B "Silver Type" | Operation Panel |
| | QGK3222K "Black Type" | Operation Panel |
| G 10 | QKJ0518 | Push Button Holder |
| G 11 | QXB0758 | Operation Button (Play) |
| G 12 | QXB0759 | Operation Button (Pause) |
| G 13 | QXB0760 | Operation Button (Record) |
| G 14 | QGO1990 "Silver Type" | Operation Button (Rec-Mute) |
| | QGO1990Y "Black Type" | Operation Button (Rec Mute) |
| G 15 | QGO1991 "Silver Type" | Operation Button (Fast Forward) |
| | QGO 1991Y "Black Type" | Operation Button (Fast Forward) |
| G 16 | QGO1993 "Silver Type" | Operation Button (Rewind) |
| | QG01993Y "Black Type" | Operation Button (Rewind) |
| G 17 | QGO1994 "Silver Type" | Operation Button (Stop) |
| | QG01994Y "Black Type" | Operation Button (Stop) |
| G 18 | QGO1995 | Push Button (Counter Reset) |
| G 19 | QYF0542 "Silver Type" | Cassette Lid Assembly |
| | QYF0542K "Black Type" | Cassette Lid Assembly |
| G 20 | QYT0636 | Volume Knob-R |
| G 21 | QYT0637 | Volume Knob-L |
| G 22 | QGT1569 | Select Knob |
| G 23 | QGO2043 | Function Button |
| G 24 | QGO2042 | Timer Buttom |
| G 25 | QGO1900 | Power Button |
| G 26 | QMR1986 | Power Rod |
| G 27 | QJC0049 | Earth Plate-A |
| G 28 | QTS1579 | Shield Plate |
| G 28 | QTS1576 | Meter Shield Plate |
| G 29 | QKM1512 | Main Case Asembly |
| G 30 | QMK1959 | Sub Chassis |
| G 31 | QTW1279 | Meter Insulating Plate |
| G 32 | XTB4 + 8BFN "Silver Type" | Screw ⊕4×8 |
| | XTB4 + 8BFZ "Black Type" | Screw ⊕4×8 |
| G 33 | QTS1575 | Microphone Shield Plate |
| G 34 | QMA4363 | Volume Angle |
| G 35 [B] [For United Kingdom.] | QGS2975 | Main Name Plate |
| G 36 | QBH2012 | Cover Cushion |
| G 38 | XTN3 + 10B | Tapping Screw |
| G 39 | XTS3 + 12B | Tapping Screw |
| G 40 | XTN3 + 10B | Tapping Screw |
| | | **ACCESSORIES** |
| A 1 | RP023A | Connection Card |
| A 2 [D] [For all European areas except United Kingdom.] | QQT3217 | Instruction Book |
| [B] [For United Kingdom.] | QQT3218 | Instruction Book |
| | | **PACKINGS** |
| P 1 | QPN4290 | Inside Carton |
| P 2 | QPA0654 | Cushion-A |
| P 3 | QPA0655 | Cushion-B |
| P 4 | XZB50X65A02 | Poly Bag |
| P 5 | QPS0618 | Pad |
| P 6 | QPC0072 | Sheet |
| P 7 | QPA0662 | Spacer |

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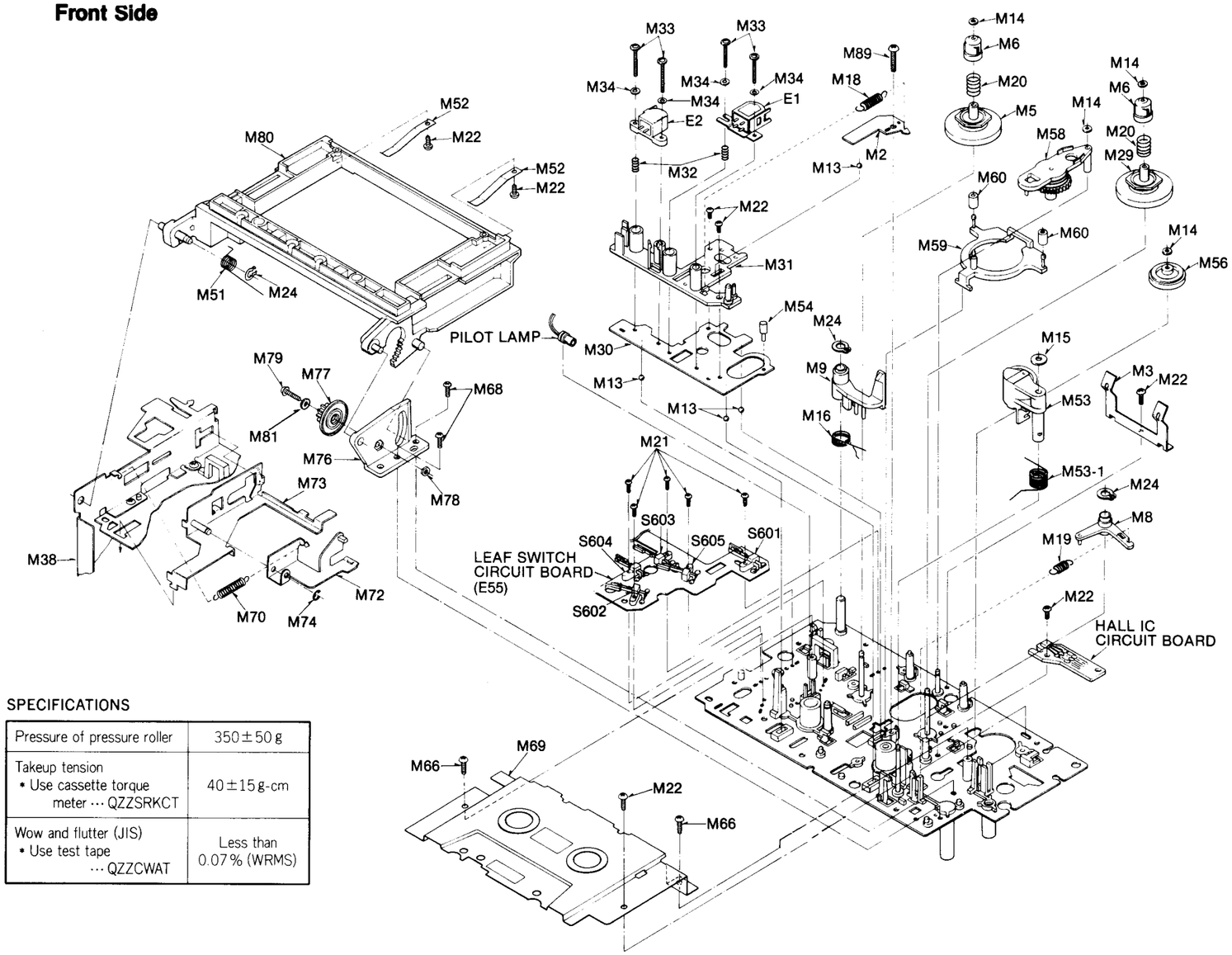
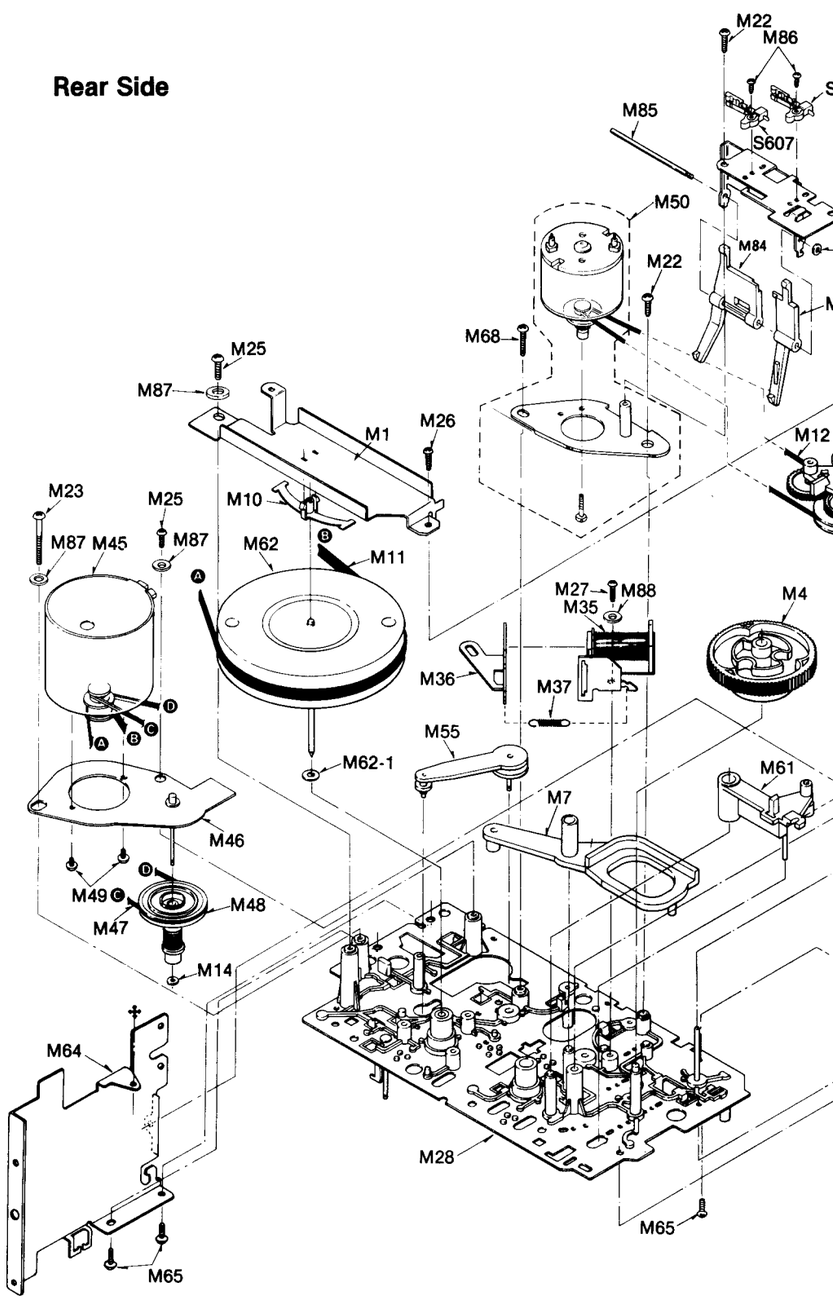
# MECHANISM PARTS LOCATION

**Front Side**




**Rear Side**

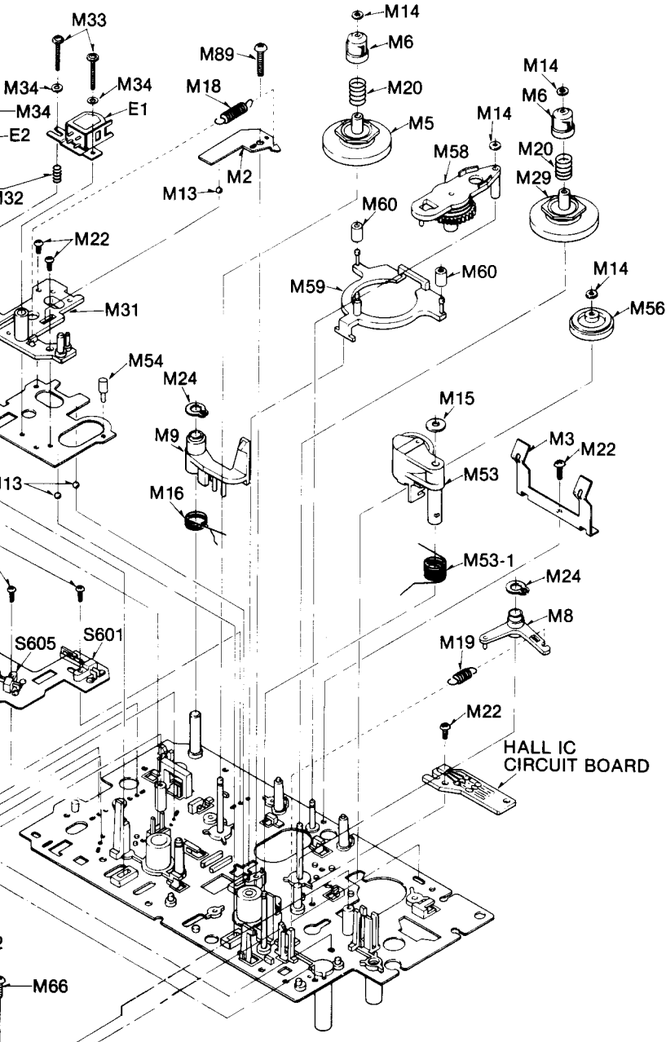



## SPECIFICATIONS

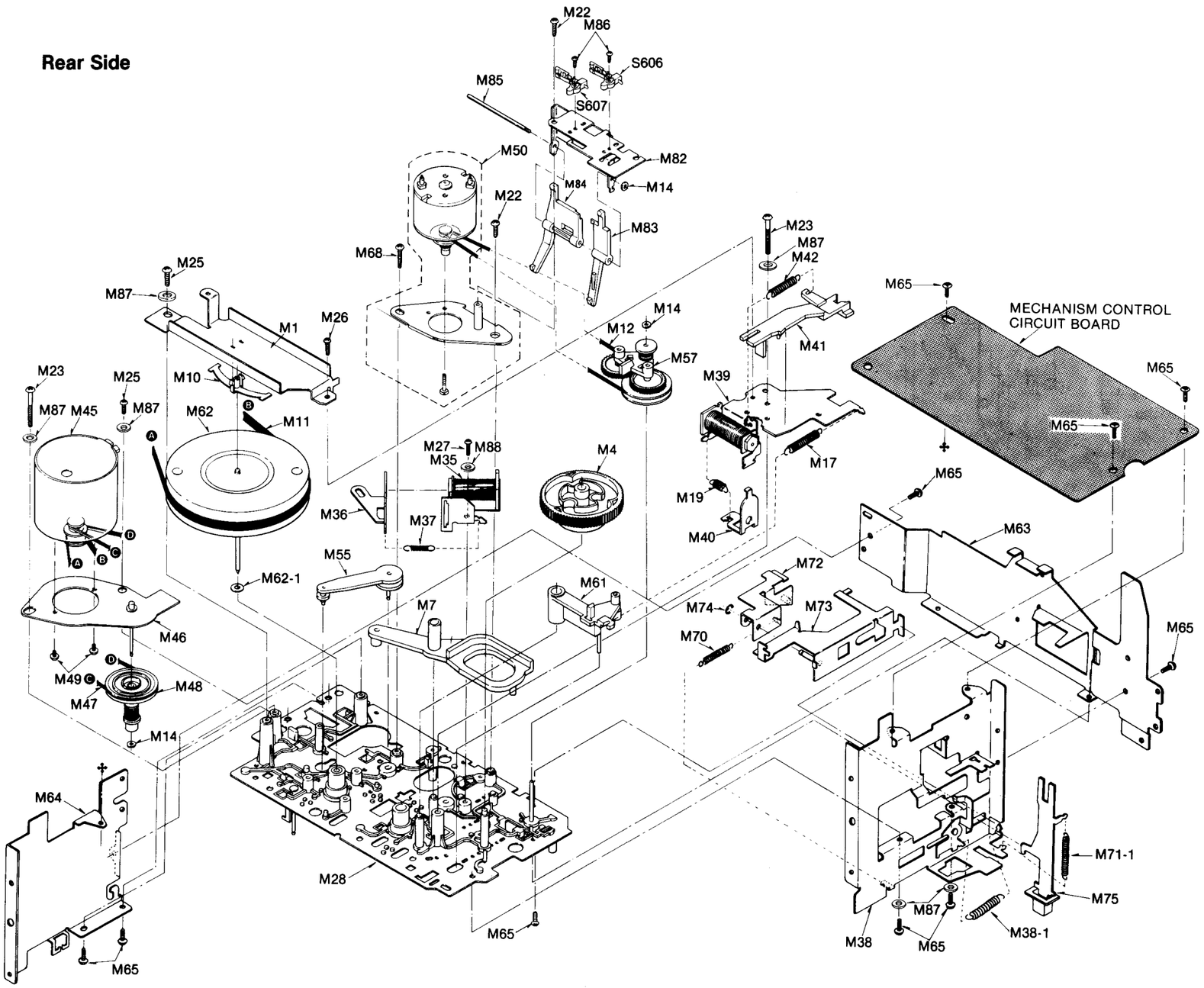
| | |
|---|---|
| Pressure of pressure roller | 350±50 g |
| Takeup tension<br>• Use cassette torque meter ··· QZZSRKCT | 40±15 g-cm |
| Wow and flutter (JIS)<br>• Use test tape ··· QZZCWAT | Less than 0.07% (WRMS) |

## REPLACEMENT PARTS LIST

| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| | **MECHANICAL PARTS** | |
| M 1 | QMA4330 | Flywheel Retainer |
| M 2 | QBP1894 | Head Base Plate Spring |
| M 3 | QBP1895 | Cassette Pressure Spring |
| M 4 | QXG1059 | Maim Gear |
| M 5 | QDR1146 | Supply Reel Table |
| M 6 | QMB1336 | Reel Table Hub |
| M 7 | QML3655 | Cam Follower |
| M 8 | QML3660 | Idler Select Lever |
| M 9 | QML3661 | Erase Safety Lever |
| M 10 | QMZ1283 | Flywheel Thrust Retainer |
| M 11 | QDB0306 | Capstan Belt |
| M 12 | QDB0287 | Reel Motor Belt |
| M 13 | QDK1012 | Steel Ball |
| M 14 | QBW2008 | Snap Washer |
| M 15 | QBW2046 | Snap Washer |
| M 16 | QBN1772 | Erase Safety Lever Spring |
| M 17 | QBT1725 | Lock Lever Spring |
| M 18 | QBT1927 | Head Base Plate Spring |
| M 19 | QBT1920 | Idler Spring |
| M 20 | QBC1373 | Reel Table Spring |
| M 21 | XTN2+6B | Tapping Screw |
| M 22 | XTN26+6BFZ | Tapping Screw |
| M 22 | XTN26+6B | Tapping Screw |
| M 23 | XTN3+24B | Tapping Screw |
| M 24 | XUB4FT | Stop Ring |
| M 25, 26 | XTN3+10B | Tapping Screw |
| M 27 | XTN26+8B | Tapping Screw |
| M 29 | QXD0120 | Takeup Reel Table Assembly |
| M 30 | QMK1867 | Head Base Plate |
| M 31 | QMZ1252 | Head Spacer |
| M 32 | QBC1103 | Head Spring |
| M 33 | XSN2+16 | Screw ⊕2×16 |
| M 34 | XWG2 | Washer |
| M 35 | QXA1232 | Brake Plunger Assembly |
| M 36 | QML3865 | Plunger Lever |
| M 37 | QBT1955 | Plunger Spring |
| M 38 | QXA1222 | Side Angle Spring |
| M 38-1 | QBT1755 | Side Angle Spring |
| M 39 | QXA1076 | Trigger Plunger Assembly |
| M 40 | QML3651 | Trigger Plunger Lever |
| M 41 | QML3653 | Control Lever |
| M 42 | QBT1278 | Record Lock Lever Spring |
| M 45 | QXU0280 | Capstan Motor Assembly |
| M 46 | QXA1077 | Motor Retainer Assembly |
| M 47 | QDB0286 | Takeup Belt |
| M 48 | QXP0621 | Takeup Pulley |
| M 49 | XSN26+3 | Screw ⊕2.6×3 |
| M 50 | QXU0250 | Reel Motor Assembly |
| M 51 | QBN1878 | Holder Spring |
| M 52 | QBP1946 | Cassette Lock Spring |
| M 53 | QXL1406 | Pressure Roller Lever |
| M 53-1 | QBN1771 | Pressure Roller Spring |
| M 54 | QMN2625 | Eccentric Pin |
| M 55 | QXL1423 | Idler Lever Assembly |
| M 56 | QXI0116 | Takeup Idler |
| M 57 | QXL1408 | Swing Gear Lever Assembly |
| M 58 | QXL1409 | Fast Wind Arm Assembly |
| M 59 | QML3659 | Brake Lever |
| M 60 | QBG1132 | Brake Rubber |
| M 61 | QXL1411 | Lock Lever Assembly |
| M 62 | QXF0190 | Flywheel Assembly |
| M 63 | QMA4358 | Center Angle |
| M 64 | QMA4359 | Side Angle-R |
| M 65 | XTN3+6B | Tapping Screw |
| M 65 | XTN3+8B | Tapping Screw |
| M 66 | XTN26+6BFZ | Tapping Screw |
| M 68 | XTN26+10B | Tapping Screw |
| M 69 | QXH0390 | Mechanism Cover |
| | "Silver Type" | |
| | QXH0390K | Mechanism Cover |
| | "Black Type" | |
| M 70 | QBT1691 | Lamp Lever Spring-B |
| M 71 | QBT1566 | Intermediate Lever S |
| M 72 | QXL1414 | lock Lever-A |
| M 73 | QXL1507 | Lock Lever-B |
| M 74 | XUC25FT | Stop Ring |
| M 75 | QXR0780 | Eject Rod Assembly |
| M 76 | QKJ0499 | Dumper Gear Holder |
| M 77 | QDG1254 | Dumper Gear |
| M 78 | XNG26 | Nut |
| M 79 | XSN26+8B | Screw |




## Rear Side




| No. | Part No. | Part Name & Description |
|---|---|---|
| | XTN26+8B | Tapping Screw |
| | QXD0120 | Takeup Reel Table Assembly |
| | QMK1867 | Head Base Plate |
| | QMZ1252 | Head Spacer |
| | QBC1103 | Head Spring |
| | XSN2+16 | Screw ⊕2×16 |
| | XWG2 | Washer |
| | QXA1232 | Brake Plunger Assembly |
| | QML3865 | Plunger Lever |
| | QBT1955 | Plunger Spring |
| | QXA1222 | Side Angle Spring |
| | QBT1755 | Side Angle Spring |
| | QXA1076 | Trigger Plunger Assembly |
| | QML3651 | Trigger Plunger Lever |

| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| M 41 | QML3653 | Control Lever |
| M 42 | QBT1278 | Record Lock Lever Spring |
| M 45 | QXU0280 | Capstan Motor Assembly |
| M 46 | QXA1077 | Motor Retainer Assembly |
| M 47 | QDB0286 | Takeup Belt |
| M 48 | QXP0621 | Takeup Pulley |
| M 49 | XSN26+3 | Screw ⊕2.6×3 |
| M 50 | QXU0250 | Reel Motor Assembly |
| M 51 | QBN1878 | Holder Spring |
| M 52 | QBP1946 | Cassette Lock Spring |
| M 53 | QXL1406 | Pressure Roller Lever |
| M 53-1 | QBN1771 | Pressure Roller Spring |
| M 54 | QMN2625 | Eccentric Pin |
| M 55 | QXL1423 | Idler Lever Assembly |

| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| M 56 | QXi0116 | Takeup Idler |
| M 57 | QXL1408 | Swing Gear Lever Assembly |
| M 58 | QXL1409 | Fast Wind Arm Assemlby |
| M 59 | QML3659 | Brake Lever |
| M 60 | QBG1132 | Brake Rubber |
| M 61 | QXL1411 | Lock Lever Assembly |
| M 62 | QXF0190 | Flywheel Assembly |
| M 63 | QMA4358 | Center Angle |
| M 64 | QMA4359 | Side Angle-R |
| M 65 | XTN3+6B | Tapping Screw |
| M 65 | XTN3+8B | Tapping Screw |
| M 66 | XTN26+6BFZ | Tapping Screw |
| M 68 | XTN26+10B | Tapping Screw |

| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| M 69 | QXH0390 | Mechanism Cover |
| | "Silver Type" | |
| | QXH0390K | Mechanism Cover |
| | "Black Type" | |
| M 70 | QBT1691 | Lamp Lever Spring-B |
| M 71 | QBT1566 | Intermediate Lever Spring |
| M 72 | QXL1414 | lock Lever-A |
| M 73 | QXL1507 | Lock Lever-B |
| M 74 | XUC25FT | Stop Ring |
| M 75 | QXR0780 | Eject Rod Assembly |
| M 76 | QKJ0499 | Dumper Gear Holder |
| M 77 | QDG1254 | Dumper Gear |
| M 78 | XNG26 | Nut |
| M 79 | XSN26+8B | Screw |

| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| M 80 | QMH2085 | Cassette Holder |
| | "Silver Type" | |
| | QMH2085K | Cassette Holder |
| | "Black Type" | |
| M 81 | XWG26 | Washer |
| M 82 | QMA4072 | Auto Tape Selector Angle |
| M 83 | QML3716 | Tape Detection Lever (for Normal/$CrO_2$ Tape) |
| M 84 | QML3717 | Tape Detection Lever (for Metal Tape) |
| M 85 | QNM2642 | Detection Lever Shaft |
| M 86 | XTN2+5B | Tapping Screw |
| M 87 | XWG3 | Washer |
| M 88 | XWG26 | Washer |
| M 89 | XTN26+12B | Tapping Screw |





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